

***Reference Guide
for the
Foreign Pharmacy
Licensing Exam***

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toxicology
physiology
calculations
microbiology
pharmaceutics
medical sociology
organic chemistry
health care delivery
medication dispensing
pharmacy administration
health care economics
medicinal chemistry
physical pharmacy
biopharmaceutics
pharmacokinetic
pharmacology
therapeutics
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chemistry
anatomy
biology



foreign pharmacy

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Revised Edition

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1. ***Benzyl alcohol*** is classified as:
- Emulsifying agent
 - Preservative
 - Diluent
 - Suspending agent
2. ***Cold cream*** is an example of:
- Suspension
 - O/W emulsion
 - W/O emulsion
 - O/W/O emulsion
3. ***Egg yolk or egg white*** is used as:
- Emulsifying agent
 - Suspending agent
 - Binder
 - Preservative
4. The transfer of a drug from high concentrated areas to low concentrated areas is generally defined as:
- Infusion
 - Levigation
 - Diffusion
 - Dissolution
5. Which of the following is the ***most suitable route*** for administration of insulin ?
- IM
 - SC
 - IV
 - IV bolus
6. ***Noyes Whitney equation*** is helpful to predict the rate of:
- Drug diffusion
 - Drug dissolution
 - Drug degradation
 - Drug oxidation
7. ***Polymorphism*** is generally defined as:
- Substance that may exist in more than one crystalline form.
 - Substance that may exist only in meta-stable form.
 - Substance that has different viscosity time to time.
 - Substance that reduces interfacial tension.
8. The minimum concentration of a drug at the receptor site to initiate pharmacological action is defined as:
- T_{max}
 - MEC
 - MTC
 - C_{max}
9. The area under curve gives useful information about :
- The amount of drug systematically absorbed.
 - The time to reach peak concentration.
 - The time to reach minimum toxic concentration.
 - The concentration at which pharmacological actions of drug would be initiated.
10. Which of the following is the major plasma protein involved in drug binding?

- a. Globulin
- b. Creatinine
- c. Albumin
- d. Glycoprotein

11. Which of the following equations may be useful to find out the plasma concentration of a drug ?

- a. $V_d \times P = C_p$
- b. $P \times C_p = V_d$
- c. $V_d = P/C_p$
- d. $V_d = C_p/P$

12. The initial dose of a drug through IV bolus to achieve desirable plasma concentration at once is known as:

- a. Loading dose
- b. Maintenance dose
- c. Replacement dose
- d. Degradation dose

13. Which of the following is/are useful to measure *glomerular filtration rate*?

- I. Creatinine
- II. Inulin
- III. Albumin

- a. I only
- b. I and II only
- c. II and III only
- d. All

14. The rapid degradation of a drug by liver enzymes in a liver is defined as:

- a. Third pass effect of metabolism
- b. First pass effect of metabolism
- c. Rapid degradation
- d. Liver elimination

15. The normal renal creatinine clearance value lies between:

- a. 200 to 300 ml/min
- b. 80 to 120 ml/min
- c. 30 to 60 ml/min
- d. 10 to 20 ml/min

16. Which of the following is an example of an *oligosaccharide*?

- a. Glucose
- b. Sucrose
- c. Starch
- d. Glycogen

17. Which *pyrimidine base* is found only in RNA?

- a. Cytosine
- b. Thymine
- c. Uracil
- d. Adenine

18. Heparin is classified as a(n):

- a. Heteropolysaccharide
- b. Oligosaccharide
- c. Homopolysaccharide
- d. Monosaccharide

19. *Ribonucleic acid* exists in all of the following forms **EXCEPT** :

- a. r RNA
- b. m RNA
- c. q RNA
- d. t RNA

20. Which of the following structures is a host for *Kreb's cycle* ?

- a. Mitochondria
- b. Golgi bodies

- c. Cytoplasmic membrane
- d. Ribosome

21. The synthesis of glucose from *sources other than carbohydrates* is generally known as:

- a. Glycolysis
- b. Gluconeogenesis
- c. Glycogenolysis
- d. Glucogenesis

22. Which of the following amino acids should be considered an *essential amino acid(s)* for the body ?

- I. Phenylalanine
- II. Leucine
- III. Tryptophan

- a. I only
- b. I and II only
- c. II and III only
- d. All

23. Which of the following enzymes catalyses the *coupling of two molecules* of nucleotides to form DNA ?

- a. Transferase
- b. Ligase
- c. Isomerase
- d. Aldehyde dehydrogenase

24. A *nucleotide* is a building block of:

- a. Sphingomide
- b. Nucleic acid
- c. Amino acid
- d. Starch

25. Which of the following cells are involved with immune responses of the body?

- I. B lymphocytes
- II. T lymphocytes
- III. Neutrophils

- a. I only
- b. I and II only
- c. II and III only
- d. All

26. Which of the following immunoglobulin levels are elevated during asthma ?

- a. IgM
- b. IgD
- c. IgE
- d. IgA

27 All of the following tests are required to check sensitivity of class A weighing prescription balance *EXCEPT* :

- a. Arm ratio test
- b. Rider graduated beam test
- c. Shift test
- d. U test

28. The ratio of the mass of an object measured in a vacuum at specific temperature to volume (in ml) of an object at the same temperature is defined as:

- a. Absolute density
- b. Specific gravity
- c. Relative density
- d. Apparent density

29. The mean blood pressure of Mr. Ham is:

01/01/00	80 mm hg	04/04/00	90 mm hg
01/02/00	82 mm hg	01/05/00	85 mm hg
01/03/00	81.5 mm hg	01/06/00	83 mm hg

- a. 81.5
- b. 85.6
- c. 83.58
- d. 84.20

30. The deviation of data from its mean is generally described by:

- a. The average
- b. The standard deviation
- c. The precision
- d. The accuracy

31. The *reproducibility of results* of a number of experiments is generally known as:

- a. Precision
- b. Bias
- c. Accuracy
- d. Closelessness

32. If the value of $p = 0.6$ in binomial distribution, what is the probability of failure ?

- a. 0.2
- b. 0.4
- c. 0.3
- d. 1.0

33. The α error is generally considered significant at:

- a. 1%
- b. 3%
- c. 5%
- d. 10%

34. When the hypothetical value of a parameter is the same as the observed value of a parameter, the error should be considered:

- a. Alfa-error
- b. Beta-error
- c. Gema-error
- d. Infinitive

35. Find out the *degrees of freedom in a Chi-square* test in a 2x2 contingency table (assume tests are independent).

- a. 1
- b. 2
- c. 3
- d. 4

36. The F distribution generally compares:

- a. Two means
- b. Two variances
- c. Three means
- d. Three variances

37. Which of the following elements has the highest *electronegativity*?

- a. Cl
- b. F
- c. Br
- d. I

38. Which of the following molecules has the largest *dipole movement*?

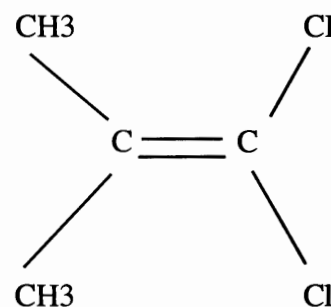


FIGURE - I

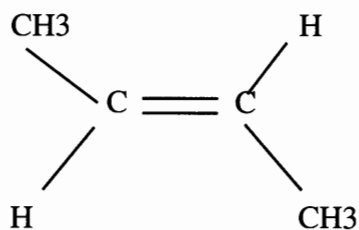


FIGURE-2

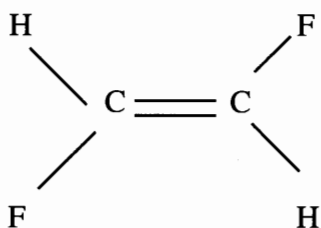


FIGURE-3

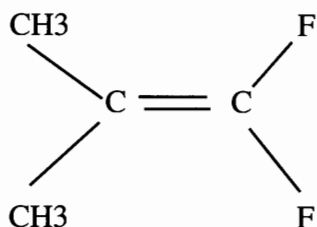


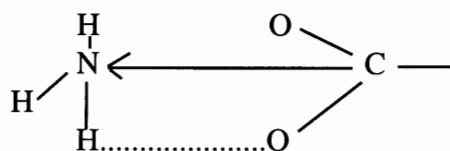
FIGURE-4

- a. Fig I
- b. Fig II
- c. Fig III
- d. Fig IV

39. Which of the following molecules has the highest boiling point?

- a. H_2O
- b. H_2S
- c. H_2Se
- d. HCN

40. The bond between NH_3 and CO_2 is best described as a:



- a. Hydrophobic interaction force
- b. Ion dipole or ion induced dipole force
- c. London force
- d. Van der Waals force

41. The process of transforming a solid directly to a vapor state is generally defined as:

- a. Evaporation
- b. Melting
- c. Sublimation
- d. Levigation

42. The characteristic of solid substances to *exhibit more than one crystalline or amorphous* form is defined as:

- a. Isomerism
- b. Polymorphism
- c. Zwitter ion
- d. Coupling

43. Which of the following molecules represents CIS form ?

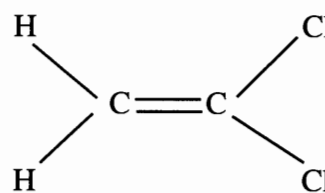


FIGURE - I

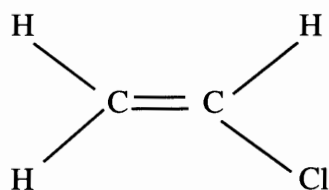


FIGURE - 2

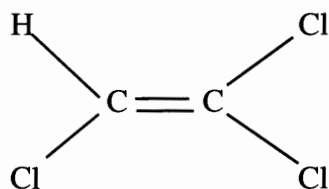


FIGURE - 3

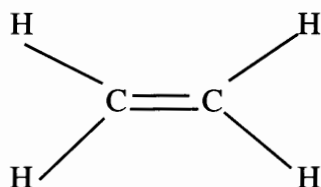


FIGURE - 4

- a. Fig I
- b. Fig II
- c. Fig III
- d. Fig IV

44. Which of the following drugs is an angiotensin receptor antagonist ?

- a. Lisinopril
- b. Losartan
- c. Methyldopa
- d. Captopril

45. According to Fick's law of diffusion, which of the following is inversely proportionate to the rate of diffusion ?

- a. The area of the solid.
- b. The difference between the concentration of solute to concentration of solute in stagnant layer.

- c. Diffusion coefficient.
- d. The length of the stagnant layer.

46. Acetone is classified as a:

- a. Polar solvent
- b. Nonpolar solvent
- c. Semipolar solvent
- d. Dipolar solvent

47. The process of degradation of ionic compounds into *cations and anions* in a presence of water is defined as:

- a. Solvation
- b. Hydration
- c. Activation
- d. Degradation

48. What happens to the solubility of alcohol as the *molecular weight of alcohol increases* ?

- a. Reduces
- b. Increases
- c. Remain unchanged
- d. Insoluble in water

49. The *degradation of Riboflavin* by light is classified as:

- a. Oxidation
- b. Reduction
- c. Photochemical degradation
- d. Racemization

50. The *degradation of Penicillin G Procaine* is highest in:

- a. Solution
- b. Suspension
- c. Elixir
- d. Tablet

51. The rate of oxidation is influenced by all of the following **EXCEPT**:

- a. Temperature
- b. Radiation
- c. Presence of catalyst
- d. Hydrolysis

52. Which of the following are characteristics of *pseudoplastic flow*?

I Viscosity of the flow generally decreases with an increase in the rate of shears.

II No yield value has been found with flow.

III. Suspension of tragacanth follows the pseudoplastic's flow.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

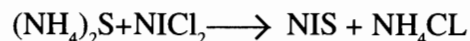
53. Which of the following is **NOT** true about *microemulsion*?

- a. The mean diameter of a droplet generally lies between 10 to 200 nm.
- b. It is a thermodynamically stable system.
- c. It requires a cosurfactant.
- d. It is intermediate in property between solution and emulsion.

54. A system with considerable interaction between *dispersed phase and dispersion medium* is known as:

- a. Lyophilic
- b. Lipophylitic
- c. Lyophobic
- d. Radioactive colloids

55. To balance the following equation, how many molecules of NH_4Cl would be required?



- a. 1
- b. 2
- c. 3
- d. 4

56. The *random motion of solute particles* in colloidal dispersion is known as:

- a. Newtonian flow
- b. Brownian motion
- c. Stoke's law
- d. Non-Newtonian flow

57. Which of the following about flocculated suspension is **NOT** true?

- a. Particles of suspension form loose aggregates.
- b. Rate of sedimentation is very low.
- c. The time to form sediment is less.
- d. The sedimentation is easy to redisperse.

58. The rate of sedimentation is independent of :

- a. The viscosity of dispersion medium.
- b. The diameter of suspended particles.
- c. The difference in densities between dispersed medium and dispersed phase.
- d. The lipophilic nature of particles.

59. Which of the following compounds is *an acetanilide*?

- a. $CH_3CONHC_6H_5$
- b. CH_3CHO
- c. $C_6H_5CH=N.C_6H_5$
- d. $C_6H_5N=NC_6H_5$

60. The spontaneous isomerization of two stereoisomers in aqueous solution that causes *specific rotation* is known as:

- a. Zwitter ion rotation
- b. Micelle rotation
- c. Mutarotation
- d. Steriorotation

61. Which of the following is a *polysaccharide*?

- a. Dextrose
- b. Dextran
- c. Lactose
- d. Sucrose

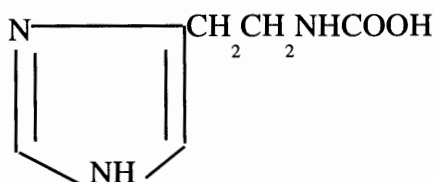
62. The substance that is isolated from the brain and produces *fatty acid, galactose and sphingosine* upon hydrolysis is known as:

- a. Sterols
- b. Phospholipids
- c. Glycolipids
- d. Saponins

63. Which of the following is NOT a hydrolyzed product of *lecithins*?

- a. Fatty acid
- b. Glycerol
- c. Phosphoric acid
- d. Spingosine

64.

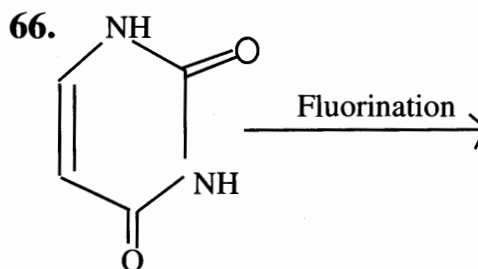


Which of the following is an *active moiety* of the above compound ?

- a. Carboxylic acid
- b. Imidazole
- c. Pyroline
- d. Aniline

65. *Albumin* is an example of a:

- a. Simple protein
- b. Conjugated protein
- c. Derived protein
- d. Hydrolysed protein



Fluorination of above compound will result into a well known cancer drug known as:

- a. Methadone
- b. 5-fluorouracil
- c. 6-mercaptopurine
- d. Procainamide

67. For *microbial assay of vitamin B-12*, the test organism should be :

- a. L.leichmani
- b. L.plantarum
- c. P.aeruginosa
- d. S.pneumonia

68. Which of the following is NOT classified as a titrimetric method of analysis?

- a. Direct titration
- b. Gravimetric titration
- c. Complexation reaction
- d. Redox reaction

69. *Hemolytic anemia* with abnormal hemoglobin is generally found in patients with :

- a. Vitamin B-12 deficiency anemia
- b. Sickle cell anemia
- c. Iron deficiency anemia
- d. Folic acid deficiency anemia

70. All of the following drugs may cause hemolysis in a patient with *G6PD deficiency* **EXCEPT** :

- a. Chloroquine
- b. Sulfonamide
- c. Dimercaptrol
- d. Penicillin

71. Which of the following drugs is useful in a *Rh negative mother with a Rh positive infant* ?

- a. Rho gam
- b. Octeroide acetate
- c. Immunoglobulin
- d. Pneu-immune

72. Which of the following is **NOT** true about PKU ?

- a. It is a disease usually characterized by mental abnormalities.
- b. A high concentration of phenylpyruvic acid is found in urine.
- c. It occurs due to excessive secretion of Phenylalanine hydroxylase enzyme.
- d. A Guthrie test is normally performed to detect it.

73. The metabolite product of *epinephrine* and *norepinephrine* is :

- a. Gama butyric acid
- b. Vanillylmandelic acid
- c. Homovanillic acid
- d. 5 Hydroxyindoleacetic acid

74. Which of the following is an *anaerobic organism*?

- a. *L. pneumophillia*
- b. *Cl. tetani*
- c. *N. meningitis*
- d. *E. coli*

75. Which of the following organisms is responsible for causing most of the *UTI* ?

- a. *S. pharyngitis*
- b. *E. coli*
- c. *N. gonorrhea*
- d. *T. palladium*

76. The accurate *diagnostic test* for a patient with cystic fibrosis is :

- a. Mantoux test
- b. Sweat test
- c. Breath test
- d. Sick test

77. The *allergic skin reaction* characterized by wheal formation is known as:

- a. Eczema
- b. Urticaria
- c. Impetigo
- d. Erythema

78. Which of the following about diabetes insipidus is **NOT** true?

- a. It is a disease usually characterized by polyuria, polydipsia, and severe thirst.
- b. The urine volume sometimes increases 16 to 24 liters a day.
- c. It is thought to occur due to over-activity of ADH.
- d. A patient should be monitored for dehydration.

79. In which kinetic reaction is the rate of reaction *independent* from concentration ?

- a. First order
- b. Zero order
- c. Pseudo first order
- d. Second order

80. The initial degradation of a drug by liver enzymes after oral administration of the drug is known as:

- a. Enzymatic degradation
- b. First pass metabolism
- c. Relative bioavailability
- d. Fick's degradation

81. Which of the following factors **DOES NOT** affect the protein binding of a drug ?

- a. The availability of protein for binding.
- b. Binding affinity of protein to the drug.
- c. The presence of competing substances for protein binding.
- d. The concentration of a drug at its receptor site.

82. In which of the following conditions is an increase in plasma protein albumin found ?

- a. Severe burns
- b. Cystic fibrosis
- c. Trauma
- d. Hypothyroidism

83. Which of the following drugs is an H_2 receptor antagonist ?

- a. Hydroxyzine
- b. Cimetidine
- c. Diphenhydramine
- d. Omeprazole

84. Which of the following drugs is indicated for *reducing elevated blood concentration of ammonia* in blood ?

- a. Lactulose
- b. Diphenoxylate
- c. Sucralfate
- d. Calcium polycarbophil

85. Patients with *hemophilia* have a deficiency of :

- a. RhoD
- b. AHF
- c. ADH
- d. ACE

86. Sodium polystyrene sulfonate is found to lower :

- a. Serum K^+ concentration
- b. Serum Na^+ concentration
- c. Serum Al^{+3} concentration
- d. Serum Ca^{+2} concentration

87. Which of the following cells are generally found to be elevated in a patient with polycythemia vera?

- a. Reticulocytes
- b. Erythrocytes
- c. Leukocytes
- d. Thrombocytes

88. Which of the following antihypertensive drugs acts by blocking *alpha-1 receptors* ?

- I. Doxazosin
- II. Terazosin
- III. Prazosin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

89. Which of the following receptor's stimulation **prevents the release of noradrenaline**?
- Alpha-1 receptors
 - Beta-1 receptors*
 - Alpha-2 receptors
 - Beta 2 receptors
90. **Hypertrichosis** is generally associated with the use of
- Hydralazine
 - Minoxidil
 - Methyldopa
 - Clonidine
91. The preferable route for Sodium Nitroprusside is
- Intramuscular
 - Oral
 - Intravenous
 - Subcutaneous
92. An overdose of sodium nitroprusside generally causes
- Severe hypotension
 - Hypertension
 - Renal failure
 - Severe edema
93. The use of Sodium Nitroprusside should be strictly restricted by :
- Adult men
 - Adult women
 - Neonates
 - Children
94. Which of the following hypertensive drugs is known as an **inodilator** ?
- Nitroglycerin
 - Milrinone
 - Dipyridamole
 - Digoxin
95. Which of the following is a Class-1A arrhythmic agent ?
- Lidocaine
 - Procainamide
 - Encainide
 - Atenolol
96. Which of the following blood cholesterol lowering drugs is an HMG-COA inhibitor ?
- Gembifrozil
 - Lovastatin
 - Cholestyramine
 - Niacin
97. A patient with acute hypercapnia should be treated with which of the following ?
- Doxapram
 - Dopamine
 - Disopyramide
 - Ipecac
98. Which of the following drugs is found to be **mucolytic or reduces** the viscosity of mucous ?
- Dextromethorphan
 - Acetylcysteine
 - Terbutaline
 - Benzonatate
99. Which of the following drugs is indicated as uterine relaxant for women in labor ?
- Ephedrine
 - Terbutaline

- c. Isoetharine
- d. Metaproterenol

100. Which of the following is an atropine-like drug?

- a. Retrovir
- b. Ipratropium
- c. Carvedilol
- d. Latanoprost

101. Which of the following is a *centrally acting* muscle relaxant ?

- a. Dantrolene
- b. Cyclobenzaprine
- c. Bromocriptine
- d. Amphetamine

102. Which of the following anti-Parkinson's drugs is a dopamine receptor agonist?

- a. Carbidopa
- b. Benztropine
- c. Bromocriptine
- d. Amantadine

103. Which of the following diuretics acts through inhibition of carbonic anhydrase enzyme?

- a. Furosemide
- b. Acetazolamide
- c. Spironolactone
- d. Hydrochlorothiazide

104. Which of the following is a common adverse effect of metolazone?

- a. Seizure
- b. Electrolyte loss
- c. S.L.E.
- d. Neuroleptic malignant syndrome

105. Which of the following diuretics cause hyperkalemia when used concurrently with Captopril ?

- I. Amiloride
- II. Spironolactone
- III. Triamterene

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

106. Probenecid may competitively inhibit the renal tubular secretion of :

- I. Methicillin
- II. Methotrexate
- III. Dapsone

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

107. Which of the following can be administered for treatment of insulin overdose ?

- I. Glucagon
- II. I.V. Dextrose
- III. Lidocaine

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

108. Which of the following *sulfonylurea agents* is indicated for the treatment of diabetes insipidus ?

- a. Glyburide
- b. Chlorpropamide
- c. Glipizide
- d. Tolbutamide

109. The deficiency of *vitamin A* may cause

- a. Osteoporosis
- b. Night blindness
- c. Scurvy
- d. Anemia

110. Which of the following can be used for the treatment of Methotrexate overdose ?

- a. Mephyton
- b. Leucovorin Ca^{+2}
- c. Pyridoxine
- d. Niacin

111. Which of the following *benzodiazepines* can be safely administered to a geriatric patient ?

- a. Chlordiazepoxide
- b. Alprazolam
- c. Oxazepam
- d. Prazepam

112. The active metabolite of Primidone is

- I. Phenobarbital
- II. PEMA
- III. Trimethadione

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

113. Which of the following drugs should not be used with Fluoxetine?

- a. Tranylcypromine
- b. Digoxin
- c. Amitriptyline
- d. Lidocaine

114. Which of the following is not classified as an insect control chemical ?

- a. Insecticides
- b. Repellents
- c. Attractants
- d. Antiseptics

115. Which of the following is **NOT** true about Barium sulfate?

- a. It is medicinally used in roentgenography for the examination of the stomach and colon.
- b. It is a clear solution.
- c. The principle adverse effect is constipation.
- d. It needs to be mixed well with food or strained through gauze before it is administered to a patient.

116. The addition of Ascorbyl palmitate in the manufacturing process serves as a :

- a. Preservative
- b. Antioxidant
- c. Coloring agent
- d. Flavoring agent

117. *Epinephrine hydrochloride* solution can be stabilized by adding a small amount of

- a. Sodium metabisulfite
- b. Sodium bisulfite
- c. Sulfur dioxide
- d. Potassium benzoate

118. Which of the following are classified as *certified colors*?

- I. FD and C
- II. D and C
- III. External D and C

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

119. Which of the following is not considered a *primary taste*?

- a. Saline
- b. Sweet
- c. Spicy
- d. Bitter

120. A 500 mg dose of a drug administered via I.V. injection produces a plasma concentration of 2.5 mcg/ml after 16 hours. If the initial plasma concentration of the drug is 10 mcg/ml, bioavailability is 1, and volume of distribution is 120,000 L, what is the half-life of the drug?

- a. 2 hours
- b. 8 hours
- c. 5 hours
- d. 15 hours

121. Sweet taste of a compound is generally attributed to :

- a. Presence of H⁺ ions
- b. Presence of OH⁻ ions
- c. Presence of cations and anions
- d. Presence of alkaloids

122. The alcohol content of low iso-alcohol elixir is :

- a. 8 to 10 %
- b. 15 to 23 %
- c. 50 to 80 %
- d. 73 to 78%

123. *Erythema multiform* is generally described as:

- a. The presence of erythematous macules and papules.
- b. The presence of hair on skin.
- c. The presence of large flaccid bullae on skin.
- d. The presence of scaling and sloughing on entire skin.

124. The antidote for *Acetaminophen toxicity* is :

- a. EDTA
- b. N-acetylcysteine
- c. Mesna
- d. Diazepam

125. Which of the following drugs may cause *cholestatic jaundice*?

- I. Chlorpromazine
 - II. Erythromycin estolate
 - III. Indomethacin
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II, and III only

126. The principal adverse effect of *Clindamycin* is :

- a. ARF (acute renal failure)
- b. TEN (toxic epidermal necrolysis)
- c. AAC (antibiotic associated colitis)
- d. ADR (adverse drug reaction)

127. Which of the following is a major adverse effect of *Chloramphenicol*?

- a. Thrombocytopenia
- b. Aplastic anemia
- c. Hemolytic anemia
- d. Agranulocytosis

128. Which of the following drugs may **NOT** cause hemolysis in patients with G6PD deficiency?

- a. Quinine
- b. Sulfonamide
- c. Nitrofurantoin
- d. Erythromycin

129. *Ringling or buzzing* in the ear is associated with :

- a. Streptomycin
- b. Salicylate
- c. Methyldopa
- d. Minocycline

130. Pigmented retinopathy is highly associated with :

- a. Chlorpromazine
- b. Thioridazine
- c. Clozaril
- d. Haloperidol

131. Which of the following drugs is associated with pulmonary dysfunction ?

- I. Bleomycin
- II. Amiodarone
- III. Nitrofurantoin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

132. Which of the following phase trials includes extensive clinical trials in a human?

- I. Phase III only
- II. Phase II only
- III. Phase I only

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

133. When *structurally different* chemicals produce the same clinical results, it is generally defined as:

- a. Chemical equivalence
- b. Bioequivalence
- c. Therapeutic equivalence
- d. Clinical equivalence

134. The parameter that is generally **NOT** included in evaluating the bioequivalency of two or more formulations of the same drug is

- a. Peak height concentration.
- b. Concentration at receptor site.
- c. Time to reach peak concentration.
- d. AUC.

135. A substance that kills microorganisms but not bacterial spores is generally defined as :

- a. Bactericide
- b. Sterility
- c. Germicide
- d. Disinfection

136. How many grams of Heparin is required to prepare 1 quart of 0.45% solution ?

- a. 2.21 grams
- b. 5.56 grams
- c. 4.32 grams
- d. 3.15 grams

137. Which of the following about moist heat sterilization is **NOT TRUE**?

- a. It is a widely used method for sterilization of mineral oil, greases and waxes.
- b. The cause of death of organisms is generally attributed to coagulation of cellular proteins of organisms.
- c. The substance should be kept loose to allow direct penetration of steam.
- d. The substance should be kept at least 15 minutes under pressure steam at a minimum of 121° temperature.

138. Which of the following gases are generally implied for *sterilization of pharmaceuticals*?

- I. Ethylene oxide
- II. Formaldehyde
- III. Sulfur dioxide

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

139 How many cc of 75% alcohol is required to prepare 35% of 500 cc of alcohol ? (You have 10% of 1000 cc of alcohol in stock.)

- a. 192.30 cc
- b. 200 cc
- c. 450 cc
- d. 325.55 cc

140. How many tablets (approximately) of 0.125 mg Lanoxin is required if the measured plasma concentration of drug is 1 mcg/ml and the desired plasma concentration of drug is 1.5 mcg/ml. The apparent volume of digoxin is 10 L/Kg for a 70 kg patient. (Assume S and F = 1)

- a. One
- b. Four
- c. Three
- d. Two

141. Sterilization by U.V. radiation generally requires a wavelength of :

- a. 320 nm
- b. 253 nm
- c. 150 nm
- d. 475 nm

142. If 1 teaspoon of Thioridazine intense solution (30 mg/cc) is diluted up to the 480 cc mark with plain water, what would be the strength of the drug in mg/ml in the final solution ?

- a. 1 mg /cc
- b. 0.52 mg /cc
- c. 0.31 mg/cc
- d. 0.75 mg/cc

143. Which of the following tests are used to identify Laminar flow efficiency and quality of sterilization?

- I. Smoke test
- II. Dop test
- III. Microbial test

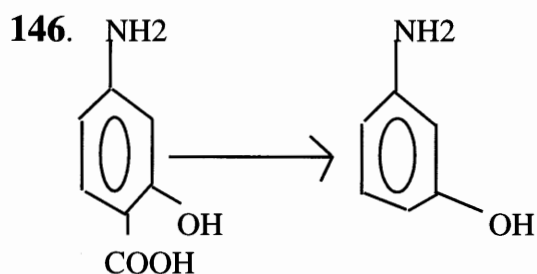
- a.. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

144.. The *rate of hydrolysis* depends on

- I. Pressure
 - II. pH of the solution
 - III. Temperature
- a.. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

145. If 1000 tablets of Risperdal 1 mg cost \$2250, and the mark-up on prescriptions is 20%, what would be the retail price of 30 tablets ?

- a. \$150
- b. \$17
- c. \$500
- d. \$81



(P-Aminosalicylic acid) (m-aminophenol)

The formation of *m-aminophenol* occurs due to :

- a. Oxidation of p-aminosalicylic acid.
- b. Decarboxylation of p-aminosalicylic acid.
- c. Reduction of p-aminosalicylic acid.
- d. Hydrolysis of p-aminosalicylic acid.

147. According to the International Pharmaceutical Federation, the **maximum percentage of overages** is limited to :

- a. 10% of over the labeled potency.
- b. 20% of over the labeled potency.
- c. 30% of over the labeled potency.
- d. 40% of over the labeled potency.

148. At what concentration does **sucrose** retard the growth of microorganisms.

- a. 20% w/w
- b. 30% w/w
- c. 65% w/w
- d. 85% w/w

149. Which of the following best describes the **Ingram's regimen** ?

- a. Combination of anthralin + UVA
- b. Combination of coaltar + UVB
- c. Combination of anthralin + UVB
- d. Combination of psoralen + UVA

150. Which of the following drugs is indicated for treatment of **cystic fibrosis**?

- a. Dornase Alfa
- b. Calcitonin salmon
- c. Acetazolamide
- d. Methotrexate

151. Find out the **ratio of ionized to unionized** species of a drug at pH = 7. The pKa of the drug is 5.

- a. 100:1
- b. 50:1
- c. 25:1
- d. 200:1

152. Ocusert Pilo 20 generally delivers

- a. 20 mcg of Pilocarpine per hour for 7 days.
- b. 20 mg of Pilocarpine per hour for 7 days.
- c. 20 mcg of Pilocarpine per hour for 3 days.
- d. 20 mg of Pilocarpine per hour for 3 days.

153. Which of the following antiglaucoma medications has a **Carbonic Anhydrase Enzyme** inhibition property?

- a. Timolol
- b. Dipivefrine

- c. Dorzolamide
- d. Latanoprost

✓ 154. If a dropper is calibrated to deliver 325 mg of iron sulfate per 0.6 cc, and the adult dose of the drug is 325 mg, *what would be the dose of drug in cc* required for a 15 month old infant ?

- a. 1.2 cc
- b. 0.3 cc
- c. 0.06 cc
- d. 0.01 cc

✓ 155. Which of the following is/are true about Triphasic oral contraceptives?

- I. Triphasic affects the follicular, ovulation and luteal phases of the menstrual cycle successfully and provides more favorable effects than biphasic and monophasic.
- II. It is generally formulated with low progesterone content.
- III. The principal advantage associated with Triphasic is the uniform direction for taking the pills.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

156. Which of the following phase(s) is/are generally dominated by *estrogen* ?

- I. Follicular phase
 - II. Ovulatory phase
 - III. Luteal phase
- a. I only
 - b. I and II only

- c. II and III only
- d. I, II and III only

157. Which of the following about Metabolic Acidosis is **NOT TRUE** ?

- a. It generally occurs due to loss of bi-carbonate from the body.
- b. Hypokalemia is generally a result of metabolic acidosis.
- c. Administration of Arginine HCl generally resolves metabolic acidosis.
- d. It stimulates the respiratory center to increase excretion of CO₂ from the body.

158. Which of the following ingredients acts as a contact poison that disturbs the parasite's nervous system?

- a. Lindane
- b. Permethrin
- c. Pyrethrin
- d. Pyrimethamine

159. Which of the following is a cough expectorant?

- a. Guaifenesin
- b. Dextromethorphan
- c. Benzonatate
- d. Diphenhydramine

✓ 160. HbA_{1c} 6% value indicates :

- a. 80 mg/dl blood glucose
- b. 120 mg/dl blood glucose
- c. 360 mg/dl blood glucose
- d. 160 mg/dl blood glucose

✓ **161.** How many milliequivalents of Ferrous sulfate are present in 325 mg of Ferrous sulfate ? (Molecular weight = 151.85 gm/mole)

- a. 5.6 meq
- b. 10.12 meq
- c. 7.5 meq
- d. 4.28 meq

162. Which of the following adverse effect(s) is/are associated with insulin therapy?

- I. Hypoglycemia
- II. Lipoatrophy
- III. Lipohypertrophy

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

163. Acarbose is contraindicated for patients suffering from :

- I. Inflammatory bowel disease
- II. Patients with colonic ulceration
- III. Patients with intestinal obstruction

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

164. Which of the following is **NOT** a symptom of hypoglycemia ?

- a. Confusion
- b. Bradycardia
- c. Difficulty in concentration
- d. Sweating

165. Which of the following diabetic drugs produces *disulfiram* reaction with alcohol?

- a. Acarbose
- b. Chlorpropamide
- c. Metformin
- d. Repaglinide

✓ **166.** Normal threshold value for glucose in the kidney is :

- a. 100 mg/dl
- b. 120 mg/dl
- c. 180 mg/dl
- d. 220 mg/dl

✓ **167.** How many mEq of Na⁺ are present in 0.9% 250 cc solution of NaCl ? [equivalent weight of NaCl = 58.5]

- a. 50.5 mEq
- b. 38.5 mEq
- c. 225 meq
- d. 58.5 mEq

168. Which of the following is **NOT** recommended to treat hypoglycemia induced by Acarbose ?

- a. Dextrose
- b. Table sugar
- c. Glucagon
- d. Glucose

✓ **169.** What is the half-life of a drug that has a rate constant of 0.067 days⁻¹ in first order kinetic ?

- a. 5 days
- b. 7.23 days
- c. 10.34 days
- d. 12.51 days

170. Which of the following is **NOT TRUE** about Vancomycin HCl ?

- a. Nephrotoxicity and ototoxicity are common complications of therapy.
- b. IV Vancomycin is indicated for treatment of antibiotic associated colitis.
- c. When taken orally, it is poorly absorbed from the GIT.
- d. It is available in oral solution, pulvules and injection form.

171. Which of the following drugs should patients with hypersensitivity to *Me-salamine* avoid ?

- I. Sulfasalazine
 - II. Olsalazine
 - III. Mesalamine
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

172. Which of the following is NOT a sign of *Grave's disease*?

- a. Fast heartbeat
- b. Weight gain
- c. Soft skin
- d. High basal metabolic rate

173. Which of the following is/are caused by thyroid hormone deficiency ?

- I. Myxedema
 - II. Cretinism
 - III. Grave's disease
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

174. Which of the following thyroid drugs should in *pregnant women* avoid ?

- a. Propylthiouracil
- b. Methimazole
- c. Propranolol
- d. Levothyroxine

175. Which of the following statements about *thyroid supplements* is/are true?

- I. Liothyronine is associated with headache, palpitation, tremor and diarrhea, and is less recommended for treatment of hypothyroidism.
 - II. Desiccated thyroid preparations have a variable T3 to T4 ratio and are less recommended by physicians.
 - III. Levothyroxine is the most recommended thyroid supplements.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

176. Which of the following drugs is indicated in *smoking cessation* programs ?

- a. Bupropion
- b. Tramadol
- c. Tamsulosin
- d. Risperidone

177. Which of the following drugs inhibits the *aggregation of platelets* ?

- I. Ticlopidine HCL
- II. Aspirin
- III. Clopidogrel

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

178. Which of the following drugs mobilizes *bone calcium* into blood ?

- a. Estrogen
- b. Calcitriol
- c. Calcitonin Salmon
- d. Alendronate Na

179. *Diphhydrotachysterol* is indicated for treatment of :

- I. Tetany
- II. Idiopathic Tetany
- III. Hypoparathyroidism

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

180. Which of the following is **NOT** a sign of *Morphine overdose*?

- a. Cold and clammy skin
- b. Respiratory depression
- c. Pupil dilation
- d. Convulsions

181. How long will it take to decompose Lanoxin in elixir to one half of its original concentration in an order that is first order kinetic ? [$K = 0.023 \text{ min}^{-1}$]

- a. 40.45 minutes
- b. 50.60 minutes
- c. 75.80 minutes
- d. 30.13 minutes

182. Which of the following glasses are most chemically resistant or least leachable?

- a. Type I borosilicate glass
- b. Type II sodalime treated glass
- c. Type III sodalime glass
- d. Type IV glass

183. According to Federal standard, class **100 clean room** is generally defined as :

- a. Not more than 100 people working in a room.
- b. Not more than 100 particles per cubic ft of 0.5 mcm or larger size.
- c. Not more than 100 bacteria per cubic ft of 40 mcm or larger size.
- d. Not more than 100 viruses per cubic ft of 40 mcm or larger size.

184. Which of the following is **NOT TRUE** about a *HEPA filter* ?

- a. It is generally described as a high efficiency particulate air filter.
- b. It has an efficiency of removing 100% of particles 0.3 mcm or larger.
- c. A Dioctyl Phthalate test (DOP) generally finds out the efficiency of HEPA filters.
- d. It is useful for the preparation of parenteral products.

185. *Cold sterilization* of parenteral solution is defined as:

- a. Removing 2 mcm or larger particles from the solution.
- b. Removing 0.2 mcm or larger particles, including microorganisms, from the solution.

- c. Sterilization of the parenteral solution with hot and cold compresses.
- d. Sterilization of the parenteral solution by freezing the solution below freezing point.

186. *Lyophilization* is defined as:

- a. The removal of water by method of sublimation from the product after it is frozen.
- b. Direct evaporation of a substance from its solid form.
- c. Preparation of colloidal solution.
- d. Removal of particulate matter by filtration.

187. Which of the following is **NOT** described as a *quality assurance and control test* for parenteral solution?

- a. Sterility test
- b. Particulate matter evaluation
- c. Pyrogen test
- d. Schilling test

188. Which of the following is **NOT** a non verbal communication?

- a. Body posture
- b. Facial expression
- c. Open-ended question
- d. Distance of the patient

189. Staff model *HMO organizations* generally own :

- I. Healthcare facilities
- II. Employed physicians
- III. Nonemployed physicians

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

190. The disadvantage associated with mail-order pharmacy services are :

- I. A lack of pharmacist counseling.
- II. A lack of review of patient's profile.
- III. The use of recycled prescription drugs.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

191. Which of the following best describes the *prospective payment* system?

- a. Reimbursement to the hospital based on cost incurred during hospitalization.
- b. Reimbursement to the hospital in advance, with a specific rate based upon diagnosis of patient.
- c. Reimbursement to hospital by patient when he/she is discharged.
- d. Prescription purchased by patient by paying cashs.

192. Most hospital pharmacies generally order their products from one wholesaler with a small percentage fee. This system is generally known as:

- a. Floor charge system
- b. Direct charge system
- c. Prime Vendor system
- d. Indirect charge system

193. Which of the following is **NOT** true about a free floor system ?

- a. It has a predetermined list of medications.
- b. The charges of used medications are made to a patient upon discharge from the hospital.
- c. It has prepackaged medications in standardized containers.
- d. The inventory is generally taken by pharmacy personnel on the spot.

194. Which of the following is **NOT** a vocal quality ?

- a. Pitch
- b. Gaze
- c. Tone
- d. Range

195. Which of the following questions generally requires **an answer** in the form of 'yes' or 'no'?

- a. Closed-ended questions
- b. Open-ended questions
- c. Indirect questions
- d. Multiple questions

196. One of Mr. Jacob's prescription signs indicates "1 gtt ou qid x10." It can be interpreted as:

- a. 1 drop to right eye four times a day for 10 days.
- b. Apply 1 tube to affected area four times a day for 10 days.
- c. 1 drop to both eyes four times a day for 10 days.
- d. 1 drop to left eye four times a day for 10 days.

197. If the pricing of prescription counts based on the percent mark up, what would be the dispensing price of a drug that costs \$20.00 ? (assume the % markup is 50%)

- a. \$10
- b. \$25
- c. \$30
- d. \$35

198. If the pharmacy has been set to receive a flat professional fee independent of the cost of the ingredient, what would be the dispensing price of a drug with a \$6.00 professional fee? (assume the cost of the ingredient is \$65)

- a. 105
- b. 71
- c. 32.50
- d. 6

199. Which of the following is generally classified as primary literature?

- a. Facts and comparisons
- b. Index medicus
- c. Matlandale extra pharmacopeia
- d. Pharmacy times

200. Which of the following is **NOT** an important consideration when selecting articles for secondary literature ?

- a. Lag time
- b. Cost
- c. Selectivity of indexing
- d. The author of an article

201. Which of the following place is more prone to accidental poisoning in children in the late morning?

- a. Kitchen

- b. Garage
- c. Bathroom
- d. Bedroom

202. Pesticides and petroleum products accidental poisoning are more likely to occur where?

- a. Kitchen
- b. Garage
- c. Bathroom
- d. Bedroom

203. Which of the following factors generally increases the risk of poisoning?

- I. Age
- II. Accessibility
- III. Type of container

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

204. Which of the following controlled substance schedules has a *high potential* for abuse?

- a. Schedule I
- b. Schedule II
- c. Schedule III
- d. Schedule IV

205. Which of the following drugs is exempt from the poison prevention packaging act?

- a. Sulfasalazine
- b. Sublingual nitroglycerin
- c. Hydrochlorothiazide
- d. Glyburide

206. Which of the following drug(s) should be dispensed with PPI?

- I. Isotretinoin
- II. Lo-ovral
- III. Loestrin Fe

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

207. Jacob Bruce wrote a prescription for Methylphenidate 5 mg. Which of the following *DEA numbers* proves the authenticity of Mr. Jacob Bruce as a physician?

- a. AA 4583215
- b. AB 3245671
- c. BA 2354321
- d. BJ 5213215

208. Which of the following about dispensing controlled substances V without a prescription by a pharmacist is NOT true?

- a. Do not dispense more than 240 cc or 48 solid dosage units of any controlled substances containing opium or more than 120 cc of other controlled substances to the same purchaser in any given 48 hours period without a prescription.
- b. The purchaser should be at least 21 years of age.
- c. A bound red book should be maintained with the name and address of the purchaser, name and quantity of the controlled substance sold, and pharmacist initials with the date the drug was dispensed.
- d. Dispensing should be done only by the pharmacist.

209. The partial filling of schedule II controlled substances must be finished within :

- a. 24 hours of initial filling
- b. 48 hours of initial filling
- c. 72 hours of initial filling
- d. 96 hours of initial filling

210. Mr. Moose has the following values for his blood pressure in mm Hg.

Mon	282
Tues	262
Wed	275
Thurs.	285
Fri	290

What is the mean blood pressure for Mr. Moose?

- a. 281.2
- b. 283.4
- c. 290.1
- d. 278.8

211. Find out the volume of Nitric oxide at 0°C and 760 mm Hg. The volume of Nitric oxide at 25°C temp and 745 mm Hg is found to be 45ml. (assume that the gas is behaving ideally)

- a. 100.25
- b. 25.10
- c. 40.41
- d. 60.65

212. A system (one component) with *gas, liquid and solid* has a degree of freedom that is:

- a. Trivariant
- b. Bivariant
- c. Invariant
- d. Univariant

213. Which of the following drugs should be classified as a *aca-channel blocker* ?

- a. Amlodipine
- b. Acyclovir
- c. Losartan
- d. Epotein

214. The *part of the molecule* that absorbs the ultraviolet light or visible light is known as:

- a. Thixotropy
- b. Chromophores
- c. Protogenic
- d. Turbidity

215. 1gram molecular weight of solute in 1 liter of solution is generally defined as :

- a. Molarity
- b. Molality
- c. Normality
- d. Mole fraction

216. Find out the molarity of a solution of sodium bicarbonate. An aqueous solution was prepared by adding 60 gm of sodium bicarbonate into 1000 ml of water. [Mol weight = 84 gm]

- a. 0.714 M
- b. 0.102 M
- c. 0.5 M
- d. 0.3 M

217. Find out the *equivalent weight* of $\text{Ca}_3(\text{PO}_4)_2$?

[MW of $\text{Ca}_3(\text{PO}_4)_2$ = 310 gm/mole]

- a. 80 gm/mole
- b. 51.7 gm/mole
- c. 40 gm/mole
- d. 35 gm/mole

218. When two compartments are separated by a *semipermeable membrane* and only solvent molecules can pass from one compartment to other compartment, the process is defined as:

- a. Diffusion
- b. Osmosis
- c. Dispersion
- d. Suspension

219. The conductance of a solution containing *1 gm of equivalent weight of the solute* measured in a cell when both electrodes are spaced 1 cm apart is known as:

- a. Molar conductance
- b. Creatinine clearance
- c. Equivalent conductance
- d. Molal conductance

220. Find out the concentration of H^+ ions, if the *pH of the solution is 5*.

- a. 10^{-3}
- b. 10^{-5}
- c. 10^5
- d. 10^1

221. Find out the *pKb of a solution* having pKa 3.5.

- a. 1.5
- b. 10.5
- c. 14
- d. 1

222. What would be the log [salt/acid] ratio for an *Acetic acid solution* with a pH of 6 and pKa of 4.76 ?

- a. 1.00
- b. 2.40
- c. 1.24
- d. 3.50

223. What is a *maximum buffer capacity* of an acetate buffer with a 0.04 mole/lit concentration ?

- a. 0.0230
- b. 0.0510
- c. 0.0411
- d. 0.0323

224. The increase in mutual solubility of *two partially miscible* liquids by the addition of a third substance is defined as:

- a. Catalyst
- b. Blending
- c. Promoter
- d. Levigation

225. Which of the following compounds is a naturally occurring chelate ?

- a. EDTA
- b. Hemoglobin
- c. Ascorbic acid
- d. Cu^{++} ion

226. The degradation of Aspirin to salicylic acid and acetic acid in the presence of water is generally known as:

- a. Oxidation
- b. Hydrolysis
- c. Photolysis
- d. Epimerization

227. Which of the following is **NOT TRUE** about Lyophilic colloids?

- a. The disperse phase of this type of colloid generally consists of large organic molecules.
- b. Molecules of the disperse phase have a high affinity for dispersion medium.

- c. Dispersed particles can be easily precipitated out in the presence of small concentration of electrolytes.
- d. Molecules of the disperse phase spontaneously form the colloidal solution.

228. The range of particle size of colloidal dispersion is:

- a. Less than 1 micrometer
- b. 0.5 to 1.0 nanomicon
- c. Greater than 0.5 micrometer
- d. 1.0 mcm to 2.0 mcm

229. *Colloidal mercury* is used as a diagnosis agent for

- a. Lyme disease
- b. Syphilis
- c. Pneumonia
- d. Rabies

230. The Brownian motion of colloidal particles can be reduced by increasing the:

- a. Surface area of colloidal particles.
- b. Viscosity of dispersion medium.
- c. Molecular weight of particles.
- d. Interfacial tension between disperse phase and disperse medium.

231. The *protective property* of colloid is generally expressed by a:

- a. Red number
- b. Gold number
- c. Silver number
- d. Green number

232. A sample of sodium bicarbonate powder weighing 150gm was found to have a bulk volume of 90 cm³ when placed in a 100 ml graduated cylinder. Calculate the porosity of the powder. (Density of NaHCO₃ = 3.5)

- a. 65 %
- b. 52 %
- c. 75 %
- d. 85 %

233. Which of the following *factors does NOT affect* the flow property of particles ?

- a. Porosity
- b. Shape
- c. Color
- d. Density

234. Which of the following is **NOT TRUE** about plastic flow?

- a. When shear stress exceeds the yield value, the flow acts as a Newtonian flow.
- b. The more flocculated the suspension, the lower the yield value would be.
- c. The flow curve generally starts at a particular point referred to as yield value.
- d. The substance that exhibit a yield value is classified as solid according to this flow.

235. If the concentration of reactant A is double in a reaction that is second order in A, by what factor will the rate of reaction change?

- a. 6
- b. 4
- c. 8
- d. 10

236. Which of the following substances exhibits the *pseudoplastic flow*?

- a. SMZ/TMP suspension
- b. Sodium carboxymethylcellulose
- c. Suspension of ZNO 75%
- d. 49% alcohol solution

237. Which of the following systems is generally recognized as a “*shear thickening*” system?

- a. Plastic flow
- b. Pseudoplastic flow
- c. Dilatant
- d. Thixotropy

238. The property of flow that generally converts to a *solution from a gel* upon applying stress, and converts back to a *gel from a sol* upon resting is known as:

- a. Plastic flow
- b. Thixotropy
- c. Pseudoplastic flow
- d. Dilatant

239. The principal of thixotropy is generally applied in all of the following formulations **EXCEPT**:

- a. Callhydrl lotion
- b. SMZ/TMP suspension
- c. Penicillin G Procaine depot injection
- d. Lanoxin elixir

240. Which of the following factors does **NOT** affect the sedimentation of flocculated particles?

- a. Size of flocculated particles.
- b. Porosity between sediment particles.
- c. Compacting and rearrangement between sediment particles.
- d. Shape of flocculated particles.

241. Which of the following is **NOT** categorized as an instability of emulsion?

- a. Creaming
- b. Microemulsion
- c. Breaking
- d. Phase inversion

242. Which of the following is **NOT** true about microemulsion?

- a. Unlike emulsion, it appears as a clear solution.
- b. They are thermodynamically stable.
- c. The diameters of droplets are between 10 to 200 nm.
- d. It is generally helpful to solubilize drugs in a pharmaceutical system.

243. The rate of release of drug from a *Gastrointestinal Therapeutic System (GITS)* follows:

- a. First order
- b. Zero order
- c. Second order
- d. Pseudo first order

244. *Medically indigent* means medical expenses are usually covered by a :

- a. Medicare program
- b. Medicaid program
- c. Self care program
- d. Blue Cross Blue Shield program

245. Which of the following about Retro-spective payment is **NOT** true?

- a. It generally depends on hospital costs and hospital charges.
- b. The payment increases as the costs of the hospital increase.

- c. It is most preferred by third party insurances.
- d. The amount of payment generally depends on the actual service provided by the hospital during the patient's stay.

246. Which of the following generally describes the *prospective payment* system?

- I. Diagnostic related group services. (DRG)
 - II. Predetermined rate of per day costs of hospital.
 - III. Predetermined rate per episode of illness.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

247. Which of the following about Preferred Provider Organizations is **NOT TRUE**?

- a. This program includes groups of hospitals and physicians that are ready to provide services to employers, insurance providents, or other third party carriers on the basis of fee for services.
- b. The subscriber can negotiate the price of fees.
- c. The freedom of choice is generally limited to a number of hospitals and physicians.
- d. It is less accepted by providers due to discounted fees and pressure to provide services at reduced costs.

248. Which of the following is the most commonly used *prescription pricing* system?

- a. Dispensing Fees method
- b. Percentage Markup method
- c. The Per diem charge method
- d. Cash method

249. Which of the following is **NOT** a part of *Retrospective DUR* study ?

- a. Number of drugs per patient.
- b. Number of doses of drugs per patient.
- c. Cost of drugs per patient.
- d. Floor stock system of drug .

250. Which of the following has the largest and most current information sources ?

- I. Primary literature
 - II. Secondary literature
 - III. Tertiary literature
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

251. Which of the following committees should review the reported *adverse drug reaction* (ADR) ?

- a. FDA
- b. P and T committee
- c. FTC
- d. EPO

252. Which of the following is a nonparametric statistic ?

- a. Mean
- b. t test
- c. Chi-square test
- d. Standard deviation

253. Which of the following tests is used to check for significance between *two or more groups of means*?

- a. Chi-square
- b. t-tests
- c. Analysis of variance
- d. Regression analysis

254. Which of the following error(s) is/are commonly associated with compliance?

- I. Overutilization of drug
- II. Underutilization of drug
- III. Administration of medication at inappropriate times.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

255. Which of the following factors are a result in non compliance of prescribed medications?

- I. Age over 65.
- II. Drug induces side effects.
- III. Fear of drug dependency.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

256. The hypersensitivity reaction that generally occurs due to pollen or grasses is classified as:

Hay fever

- a. Type I hypersensitivity reaction
- b. Type II hypersensitivity reaction
- c. Type III hypersensitivity reaction
- d. Type IV hypersensitivity reaction

257. Which of the following drugs is indicated for the treatment of *P.carini.Pneumonia* ?

- a. Pentamidine
- b. Erythromycin
- c. Phenobarbital
- d. Gabapentin

258. The principal adverse effect of *Cloz-aril* is :

- a. Hypotension
- b. Hypertrichosis
- c. Agranulocytosis
- d. Renal failure

259. Which of the following is **NOT** a Type III hypersensitivity reaction ?

- a. Rheumatoid arthritis
- b. Lupus erythematosus
- c. Contact dermatitis
- d. Sjogren syndrome

260. *Grave's disease* is generally classified as:

- a. Type I hypersensitivity
- b. Type V hypersensitivity
- c. Type II hypersensitivity
- d. Type III hypersensitivity

261. Which of the following is **NOT** an organ specific autoimmune disorder ?

- a. Hashimoto's thyroiditis
- b. Myasthenia gravies
- c. S.L.E.
- d. Multiple sclerosis

262. Which of the following about monoclonal antibodies is/are true?

- I. Monoclonal antibodies are a specific antigen derived from a single cell line.

II. Murine monoclonal antibody and Digibind are the only two FDA approved monoclonal antibodies available in market.

III. They are much safer and specific compared to regular antibodies.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

263. Which of the following drugs is classified as a *Loop diuretic* ?

- a. Furosemide
- b. Spironolactone
- c. Acetazolamide
- d. Mannitol

264. Which of the following antihypertensive agents acts by stimulation of *alpha-2 receptors*?

- a. Hydralazine
- b. Methyldopa
- c. Captopril
- d. Propranolol

265. Which of the following is true about the *transfer of a drug from the stomach into the blood stream*?

- I. The rate of passive diffusion of the drug generally depends on the lipid solubility of the drug.
- II. The drug generally crosses the cell barrier by passive or active transfer mechanism.
- III. The higher the amount of ionized fraction of drug, the higher the amount of drug will transfer and be absorbed into the blood.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

266. *Basic drugs* are found to bind to:

- I. Albumin
- II. Beta-globulin
- III. Acid glycoprotein

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

267. Which of the following indicates the *phase II* drug metabolism?

- a. Oxidation
- b. Reduction
- c. Glucuronidation conjugation
- d. Hydrolysis

268. The precursor for *5-HT* is :

- a. Tryptophan
- b. Leucine
- c. Isoleucine
- d. Valine

269. Which of the following is **NOT** a pharmacological action of Histamine?

- a. Cardiac depression
- b. Gastric acid stimulation
- c. Vasodilation
- d. Contraction of smooth muscles

270. Which of the following prostaglandins have a *gastric mucosal protection* property?

- a. PGH_2
- b. PGI_2

- c. PGE_2
- d. PGD_2

271. Which of the following substances is responsible for *causing dry cough* in patients receiving ace-inhibitor therapy?

- a. Prostaglandin
- b. Bradykinin
- c. Interleukine
- d. Leukotriene

272. Which of the following is an important *risk factor associated* with atherosclerosis?

- a. LDL
- b. HDL
- c. VLDL
- d. Triglyceride

273. Which of the following factors associates with *aggregation of platelets* ?

- a. Leukotriene
- b. Thromboxane A_2
- c. Bradykinin
- d. Arachidonic acid

274. Which of the following is a *muscarinic receptor antagonist* ?

- a. Albuterol
- b. Ipratropium
- c. Theophylline
- d. Triamcinolone

275. *Metabolic alkalosis* is reported with :

- a. Spironolactone
- b. Hydrochlorothiazide
- c. Amiloride
- d. Triamterene

276. Which of the following *receptor(s)* is/are associated with emesis ?

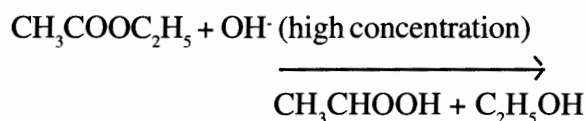
- I. H_1 receptors
- II. D_2 receptors
- III. 5HT_3 receptors

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

277. $X^2 + Y^2 = 1$ would be graphed as :

- a. Parabola
- b. Circle
- c. Straight line
- d. Eclipse

278. The equation below shows the formation of ethanol and acetic acid :



The *above equation follows*:

- a. First order
- b. Zero order
- c. Pseudo first order
- d. Second order

279. If $Y = 1 - X^2$ then calculate the limit when $\lim_{X \rightarrow 2}$

- a. 5
- b. -3
- c. 2
- d. 1

280. Which of the following is classified as a *negative catalyst* ?

- I. Ascorbic acid
 - II. Sodium sulfite
 - III. Sodium metabisulfite
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

281. Which of the following drugs is an inhibitor of HMG-COA ?

- a. Gemfibrozil
- b. Simvastatin
- c. Theophylline
- d. Niacin

282. Which of the following glands generally matures the T cell ?

- a. Thyroid gland
- b. Thymus gland
- c. Pituitary gland
- d. Adrenal gland

283. Which of the following is a drug of choice for treatment of *multiple sclerosis*?

- a. Cyclosporine
- b. Dantrolene
- c. Methylprednisolone
- d. Cyclophosphamide

284. Which of the following is **NOT** an example of a live attenuated vaccine ?

- a. Measles
- b. Diphtheria
- c. Rubella
- d. Mumps

285. Which of the following is **NOT** true about *acid test* ratio?

- a. It generally indicates liquidity of a pharmacy.
- b. It is expressed by the ratio of quick asset to current liability of a pharmacy.
- c. For a pharmacy's successful financial position, this ratio would generally be greater than 2.
- d. The closer the current liability to a pharmacy's quick asset, the more ideal the acid-test ratio.

286. *Working capital* is generally expressed by :

- a. Inventory ratio to working capital.
- b. The difference between current asset and current liabilities of pharmacy.
- c. Quick assets ratio to current liability.
- d. Cost of goods ratio to inventory.

287. Which of the following is **NOT** true about exotoxin ?

- a. It is generally an end product of metabolism produced by gram +ve bacteria.
- b. It is water soluble and has the ability to pass through a surrounding cell.
- c. It is more toxic in nature than endotoxin.
- d. It is thermolabile in nature and can be easily destroyed at temperature greater than 60°C.

288. *Health Brief Model* is used to study patient behavior about :

- I. How to prevent illness.
 - II. How to stick to a proper diet.
 - III. How to take the drugs.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

289. The chances of noncompliance are high if :

- I. Prescribed medication is too costly to buy.
 - II. Patient age is over 60 years.
 - III. Patients do not know the importance of taking the drugs.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

290. The *evaluation of a placebo* can be done by :

- I. Double blind study
 - II. Single blind study
 - III. Pseudo blind study
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

291. Which of the following is known as the digestive organ of cell ?

- a. Lysosome
- b. Endoplasmic reticulum
- c. Mitochondria
- d. Golgi body

292. Which of the following is normally **NOT** found in bacteria but present in human cells ?

- a. Golgi body
- b. Mitochondria
- c. Lysosome
- d. Endoplasmic reticulum

293. Which of the following is/are true about Lysozyme?

- I. It is generally known as the power house of a cell.
 - II. It helps in the removal of damaged cell.
 - III. It contains a bactericidal agent such as lysozyme that kills bacteria before it damages the cell.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

294. Which of the following is a powerful **nonverbal** form of communication?

- a. Kinetic
- b. Proxemic
- c. Effective listening
- d. Gesture

295. Which of the following is **rate limiting step** in synthesis of RBC?

- a. Availability of pre-erythrocytes
- b. Availability of hemoglobin

- c. Oxygen transport capacity
- d. Presence of erythropoietin

296. Which of the following helps in *absorption of vitamin B₁₂*?

- a. Erythropoietin
- b. Intrinsic factor
- c. Hemoglobin
- d. Apoferritin

297. Which of the following is a good source of *Folic acid*?

- a. Carrots
- b. Green vegetables
- c. Milk
- d. Fish

298. The life span of RBC is :

- a. 90 days
- b. 30 days
- c. 120 days
- d. 60 days

299. Which of the following about iron is/are true?

- I. Reticuloendothelial cells, liver hepatocytes and apoferritin are important iron storage sites.
 - II. Apotransferritin is generally combined with iron in the small intestine, which later is secreted into the blood.
 - III. The spleen and bone marrow are important sites for destruction of RBC.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

300. The lack of function of bone marrow generally results in :

- a. Sick cell anemia
- b. Aplastic anemia
- c. Megaloblastic anemia
- d. Pernicious anemia

301. Polycythemia vera is defined as an:

- a. Increase of WBC.
- b. Increase of RBC.
- c. Increase of lymphocytes.
- d. Increase of thrombocytes.

302. Which of the following organisms is found in *normal flora* of the human respiratory tract?

- a. S. Pyrogen
- b. S. Viridan
- c. Staphylococcus aureus
- d. S. epidermis

303. Which of the following organisms is/are responsible for causing *meningitis* in humans?

- I. N. meningitis
 - II. H. influenza
 - III. S. pneumonia
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

304. Which of the following organisms is responsible for *causing 80% or more* of bone infections?

- a. S.pyrogen
- b. S. aureus
- c. Cl.difficile
- d. M. pneumonia

305. Which of the following about lyme disease is **NOT TRUE** ?

- a. The origin or occurrence of this disease is the bite of ticks.
- b. It can be identified by the presence of annular skin lesions found on the thighs and buttocks.
- c. The bite of a tick is extremely painful.
- d. The disease is usually associated with cvs and neurological complications.

306. Which of the following *gram-negative* organisms is responsible for causing most urinary tract infections ?

- a. *S. aureus*
- b. *E. Colli*
- c. *K. pneumonia*
- d. *P. aeruginosa*

307. The major biotransformation site of a drug in humans is the :

- a. Spleen
- b. Liver
- c. Kidney
- d. Intestine

308. Which of the following *increases* the excretion of Phenobarbital ?

- a. Ascorbic acid
- b. Orange juice
- c. Sodium bicarbonate
- d. Ammonium chloride

309. Which of the following causes *syphilis* ?

- a. *N. Gonorrhea*
- b. *T. Palladium*
- c. *Granulomatoses shigellas*
- d. *Candida albican*

310. Which of the following *organisms* is found in a normal flora of guts ?

- I. *Salmonella*
- II. *E. Colli*
- III. *N meningitis*

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

311. Which of the following factors affects the solubility of solutes?

- I. Temperature
- II. pH
- III. Common ion effects

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

312. In the phase diagram, when *three phases exist in equilibrium* with one another it is generally defined as:

- a. Triple phase point
- b. Cloudiness point
- c. Triple point
- d. Absolute point

313. When a substance tends to lose water to establish an equilibrium with surrounding atmosphere, and forms an anhydrous salt, it is generally known as:

- a. Extraction
- b. Efflorescence
- c. Deliquescence
- d. Effervescence

314. Which of the following ingredients is used as a desiccant in pharmaceutical preparations?

- a. Lead
- b. Silica
- c. Aluminium
- d. Copper

315. The *minimum concentration* at which physical properties of solutions of association colloids, such as electrical conductance and osmotic pressure, show marked changes is known as:

- a. MEC
- b. CMC
- c. MTC
- d. Phase Inversion

316. Which of the following *is/are* Xerogels?

- I. Gelatin sheets
- II. Acacia tears
- III. Starch grains

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

317. Which of the following is **NOT** a physical property of gel ?

- a. Swelling
- b. Conductance
- c. Syneresis
- d. Aging

318. Which of the following is a half-life equation for *zero-order* reaction?

- a. $t_{1/2} = 0.693/k$
- b. $t_{1/2} = 0.963/k$
- c. $t_{1/2} = a/2k$
- d. $t_{1/2} = 1/ak$

319. Which of the following is **NOT** generally included in accelerated stability testing of pharmaceuticals?

- a. Temperature
- b. Humidity
- c. Hydrolysis
- d. Light

320. Which of the following tests differentiates between *gram positive and gram negative*?

- a. Phenol coefficient test
- b. Acid fast stain
- c. Gram stain
- d. Chick martin test

321. Which of the following tests identifies the immunity in tuberculosis patients ?

- a. Schick test
- b. Mantoux test
- c. Schilling test
- d. Virulence test

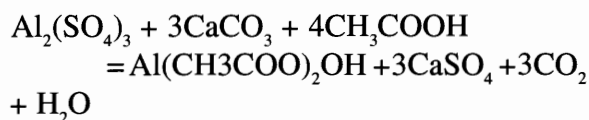
322. *Collected blood* should be stored at:

- a. 10 to 20°C
- b. 4 to 6°C
- c. 8 to 15°C
- d. 25°C

323. The *pharmaceutical use* of Chlormerodrin (radioisotope) is:

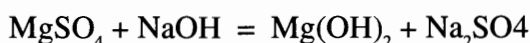
- a. To localize brain tumors.
- b. To identify thyroid function.
- c. To treat polycythemia vera.
- d. To trace metabolism of vitamin B-12.

324. The following equation describes the preparation of *Aluminum acetate* and is known as Burrow's solution. How many molecules of Aluminum acetate are required to balance the following equation ?



- a. 3
- b. 2
- c. 6
- d. 1

325. The following equation describes the preparation of milk of magnesia. How many molecules of Sodium hydroxide are required to balance the following equation?



- a. 2
- b. 3
- c. 4
- d. 5

326. Which of the following is/are true about protein binding?

- I. It makes drugs is inactive.
- II. It serves as a storage for drugs.
- III. It delays the metabolism and excretion of a drug.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

327. Which of the following factors affect the protein binding of drugs?

- I. Pregnancy
- II. Hypoalbuminemia
- III. Uremia

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

328. The inactive drug that becomes active through metabolism is known as:

- a. Prephase drug
- b. Prodrug
- c. First pass drug
- d. Delayed action drug

329. The major *metabolic product* of Sulfanilamide in humans is:

- a. m hydroxyalanine
- b. p hydroxy benzene sulfonamide
- c. phydroxysulfanilamide
- d. o,m dihydroxysulfanilamide

330. The metabolic product of *nor-adrenaline* is:

- a. Acetic acid
- b. Mandelic acid
- c. Dihydroxy ethyl butyric acid
- d. Nalidixic acid

331. Which of the following drugs is secreted by *renal tubular secretion*?

- I. Probenecid
- II. Penicillin
- III. Chlorothiazide

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

332. Which of the following factors affect *the half-life* of drugs?

- I Renal insufficiency.
- II Change in urinary pH.
- III. Enzyme inducing drugs.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

333. Which of the following parameters can evaluate bioequivalency of the drugs?

- I. Time to reach peak concentration
- II. AVC
- III. Concentration of the drug at plateau level

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

334. The type of study where the nature of a drug is concealed from the patient as well as the attending physician is known as a:

- a. Single blind study
- b. Double blind study
- c. Random blind study
- d. Polyblind study

335. The synthesis of *Acetylcholine* occurs in nerve fibres in the presence of:

- I. CAT
- II. COMT
- III. MAO

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

336. Cholinergic drugs are useful in treatment of all of the following **EXCEPT** :

- a. Glaucoma
- b. Atony of bladder
- c. Asthma
- d. Myasthenia gravis

337. Which of the following receptor's stimulation prevents the release of *noradrenalin* ?

- a. Alpha-1
- b. Alpha-2
- c. Beta-1
- d. Beta-2

338. Which of the following drugs produce its pharmacological actions by blocking *Alpha-1 receptors* ?

- I. Prazosin
- II. Terazosin
- III. Doxazosin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

339. *Heavy smokers* are more likely to have:

- I. Chronic bronchitis
 - II. Emphysema
 - III. Peripheral vascular disease
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

340. Which of the following drugs an *inhibitor of cholinesterase enzyme* ?

- I. Physostigmine
 - II. Neostigmine
 - III. Bethanechol
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

341. Which of the following drugs is a *parasympatholytic* agent?

- a. Demecarium
- b. Homatropine
- c. Pilocarpine
- d. Carbachol

342. Which of the following drugs is useful for treatment of *acute atropine poisoning*?

- a. Acetylcholine
- b. Physostigmine
- c. Trihexylphenidyl
- d. Propantheline

343. Which of the following drugs is useful for *muscle spasm and rigidity of skeletal muscles*?

- I. d-tubocurarine
 - II. Succinylcholine
 - III. Dantrolene
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

344. Which of the following anesthetics (given by I.V. route), is useful for producing *short-term* anesthesia ?

- a. Lidocaine
- b. Thiopental sodium
- c. Chloroform
- d. Nitrous oxide

345. Which of the following ions is associated with *GABA receptors* to produce tranquilizing effects ?

- a. Sodium ions
- b. Potassium ions
- c. Chloride ions
- d. Lithium ions

346. The percentage of *alcohol* found in wine is:

- a. 4 to 6%
- b. 10 to 20 %
- c. 40 to 60%
- d. 60 to 70%

347. The antidote for *Methanol* poisoning is:

- a. Diazepam
- b. Ethanol
- c. Barbiturate
- d. Hydroxyzine pamoate

348. Which of the following is **NOT** a disulfiram-like reaction ?

- a. Flushing of skin
- b. Palpitation with throbbing headache
- c. Increase in blood pressure
- d. Nausea and vomiting

349. Which of the following is classified as a *class-1A antiarrhythmic* agent?

- a. Phenytoin
- b. Quinidine
- c. Lidocaine
- d. Encainide

350. Which of the following disorders is responsible for causing secondary hypertension?

- I. Hyperaldosteronism
- II. Pheochromocytoma
- III. Cushing's syndrome

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

351. Which of the following factors may increase the chances of essential hypertension?

- I. High salt intake
- II. Hyperlipidemia
- III. Obesity

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

352. Which of the following metabolites of Methyldopa acts as a false neurotransmitter?

- a. Vandellic acid
- b. Alpha-methyl noradrenaline
- c. Beta-methyl noradrenaline
- d. Dopamine

353. Which of the following antihypertensive drugs should be avoided by patients with severe depression?

- I. Clonidine
- II. Methyldopa
- III. Reserpine

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

354. Which of the following substances may cause profound *vasoconstriction* ?

- a. Angiotensinogen
- b. Angiotensin-II
- c. Aldosterone
- d. Angiotensin-I

355. Which of the following is **NOT** an adverse effect associated with vasodilators ?

- a. Edema
- b. Palpitation
- c. Bradycardia
- d. Weight gain

356. The first dose syncope is normally reported with:

- a. Prazosin
- b. Hydralazine
- c. Minoxidil
- d. Captopril

357. Which of the following substances should be given by I.V. to detoxify *cyanomethemoglobin* produced by administration of sodium nitrate ?

- a. Sodium bicarbonate
- b. Glucose

- c. Sodium thiosulfate
- d. Sodium hydroxide

358. Which of the following salts produces an acidic solution?

- a. Salt of weak acid with strong base
- b. Salt of strong acid with strong base
- c. Salt of weak acid with weak base
- d. Salt of strong acid with weak base

359. Which of the following antihistamines has no sedation properties ?

- I. Astemizole
- II. Cetirizine
- III. Terfenadine

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

360. Which of the following hormones is secreted through the anterior pituitary ?

- I. Growth hormone
- II. Thyrotropic hormone
- III. Oxytocin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

361. The function of the anterior pituitary gland is controlled by the :

- a. Thymus gland
- b. Hypothalamus
- c. Brain
- d. Pineal gland

362. Any fall in the level of thyroid hormone in the blood generally stimulates the release of :

- a. GHRF
- b. TRF
- c. FSRF
- d. ACRF

363. The *hypersecretion of growth hormone* in human may cause :

- I. Gigantism
- II. Acromegaly
- III. Dwarfism

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

364. Which of the following hormones is responsible for lactation in the postpartum state of women?

- a. Vasopressin
- b. Prolactin
- c. Oxytocin
- d. Calcitonin

365. Which of the following takes an active part in the function of the thyroid gland?

- a. Mono iodothyronine
- b. Di iodothyronine
- c. Tri iodothyronine
- d. Tetra iodothyronine

366. All of the following thyroid disorders occur due to deficiency of thyroid hormone **EXCEPT:**

- a. Cretinism
- b. Myxedema
- c. Goitre
- d. Grave's disease

367. All of the following are signs of hyperthyroidism **EXCEPT**:

- a. Weight loss
- b. Slow heartbeats
- c. High BMR
- d. Staring eyes

368. Which of the following glands **regulates the mobilization of calcium** between bone and blood?

- a. Adrenal
- b. Parathyroid
- c. Pituitary
- d. Pancreas

369. Which of the following about juvenile onset diabetes is **NOT** true?

- a. It commonly occurs at a young age.
- b. The Beta cells of the pancreas respond to oral sulfonylurea agents.
- c. It has rapid onset and progression.
- d. Development of ketoacidosis and coma have been frequently reported.

370. Which of the following is **NOT** a long-term complication associated with diabetes?

- a. Cataracts
- b. Emphysema
- c. Renal failure
- d. Peripheral neuropathy

371. A normal person's pancreas secretes how many units of insulin per day?

- a. 10
- b. 50
- c. 100
- d. 200

372. The synthesis of glucose from **non-carbohydrate** sources is defined as:

- a. Glycolysis
- b. Gluconeogenesis
- c. Glycogenolysis
- d. Glycogenesis

373. Sulfonylurea stimulates the release of insulin from the pancreas by stimulating the:

- a. Alfa-cells of islets of Langerhans
- b. Beta-cells of islets of Langerhans
- c. Juxtaglomerular cell of the kidney
- d. Zona-glomerulosa cell

374. Which of the following is a major precursor of steroid hormone?

- a. Cholesterol
- b. Triglyceride
- c. Bile acid
- d. Sphingoid

375. Which of the following is a naturally occurring glucocorticoid ?

- a. Prednisone
- b. Cortisol
- c. Triamcinolone
- d. Dexamethasone

376 A **sodium restricted diet** is usually preferred for a patient suffering from hypertension, because.

- a. Clinical research proves that sodium ions have high probability of producing hypertension.
- b. Sodium ions help the secretion of nor-adrenaline from the brain terminal.
- c. Sodium ions hold the water molecules which results in increased blood volume.
- d. Sodium ions play an important role in the conduction of heart rhythm.

377. In which of the following *DUR methods* is the review performed after the patient receives the drug?

- I. Retrospective DUR
- II. Prospective DUR
- III. Concurrent DUR

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

378. Which of the following is an *estrogen receptor* antagonist ?

- a. Prednisone
- b. Tamoxifen
- c. Medroxyprogesterone
- d. Ethinyl estradiol

379. Which of the following is a good source of vitamin A ?

- a. Cod liver oil
- b. Carrots
- c. Citrus fruits
- d. Leafy vegetables

380. Which of the following is **NOT** a diagnosis symptom of Scurvy?

- a. Bleeding from gums
- b. Hemorrhage
- c. Defective bone and teeth
- d. Retarded healing

381. The cause of *Beriberi* is due to a deficiency of:

- a. Vitamin A
- b. Vitamin B-1
- c. Vitamin B-2
- d. Vitamin B-12

382. Pernicious anemia is generally reported due to a deficiency of :

- a. Folic acid
- b. Iron
- c. Vitamin B-12
- d. Thiamine

383. Green vegetables, liver and pulses are good sources of :

- a. Vitamin B-12
- b. Folic acid
- c. Thiamine
- d. Riboflavine

384. Abnormal destruction of RBC is generally defined as:

- a. Nutritional anemia
- b. Aplastic anemia
- c. Hemolytic anemia
- d. Hemorrhagic anemia

385. A *deficiency of iron* would normally cause:

- I. Hypochronic anemia
- II. Hyperchronic anemia
- III. Pernicious anemia

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

386. Which of the following iron salts has the greatest amount of elementary iron ?

- a. Ferrous gluconate
- b. Dried ferrous sulfate
- c. Ferrous fumarate
- d. Ferrous sulfate

387. Which of the following ratios is the best indicator of a pharmacy's profitability ?

- a. Net profit to net sales
- b. Net profit to net worth
- c. Net profit to total asset
- d. Net profit to inventory

388. Which of the following ratios generally indicates the efficiency of a pharmacy ?

- a. Net profit to total assets.
- b. Inventory turnover rate
- c. Capitalization of net profit
- d. Net profit to net sales

389. All of the following indicate the ratio that measures the efficiency of a pharmacy **EXCEPT:**

- a. Inventory turnover rate
- b. Net sales to inventory
- c. Acid test
- d. Net sales to net working capital

390. The acceptable ratio for net profit to net sales would be:

- a. Less than 1%
- b. 1 to 2 %
- c. 2 to 3 %
- d. 5 to 7%

391. What would be the acceptable ratio for 10 year old pharmacy's net profit to net worth?

- a. 1%
- b. 5%
- c. 15%
- d. 50%

392. Which of the following is true about net profit to inventory ratio?

- I. It indicates profitability as well as the efficiency of pharmacy.
 - II. It can be used for new and old pharmacies.
 - III. It increases with an increase in sales of the pharmacy.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II, and III only

393. Manan Pharmacy's net profit to total assets ratio is found to be 15%. This will indicate the pharmacy's profitability is :

- a. Good
- b. Excellent
- c. Outperform
- d. Worst

394. Manan's Pharmacy's part of the financial balance sheet is as follows:

YEAR 2000 SALES

RX	\$600,000
Merchandise	\$150,000
Total	\$750,000
Cost of goods sold	\$500,000
Beginning inventory	\$200,000
Ending inventory	\$220,000

What would be the inventory turnover rate for Manan's Pharmacy?

- a. 4.3
- b. 2.38
- c. 3.5
- d. 6.0

395. The inventory turnover rate of the above pharmacy would :

- a. Meet the expectation
- b. Below the expectation
- c. Exceed the expectation
- d. Cannot calculate

✓ **396.** The net sales of the above pharmacy are 840,000. Find out the ratio of net sales to inventory of the above pharmacy. [assume inventory of above pharmacy at time of calculation is \$210,000]

- a. 8
- b. 4
- c. 10
- d. 12

397. Find out the net worth of Manan's Pharmacy?

Total current assets = \$150,000
Total fixed assets = \$40,000
Total liabilities = \$75,000

- a. 2.55
- b. 115,000
- c. 35,000
- d. 1.3

398. Which of the following ratios best describes the account receivable collection times?

- a. $\frac{\text{year end account receivable}}{\text{mean credit sales per day}}$
- b. $\frac{\text{annual credit sales}}{\text{total account receivable}}$
- c. $\frac{\text{total account receivable}}{365}$
- d. $\frac{\text{annual credit sales}}{24}$

399. Which of the following classes of recalls should be considered a potential hazard to health ?

- a. Class I
- b. Class II
- c. Class III
- d. Class IV

400. Which of the following categories indicates the use of a drug is restricted during pregnancy ?

- a. A
- b. B
- c. X
- d. C

401. *Liquidity* generally expresses a pharmacy's ability to meet its:

- a. Assets
- b. Current liability
- c. Inventory
- d. Prepaid expenses

402. The acid test generally measures a pharmacy's :

- a. Financial position
- b. Liquidity
- c. Profitability
- d. Inventory

403. Which of the following is generally **NOT** included in current assets ?

- a. Cash
- b. Accounts payable
- c. Accounts receivable
- d. Inventory

404. Which of the following would generally be considered the *fixed assets* of a pharmacy?

- a. Inventory
- b. Fixtures and equipment
- c. Cash
- d. Accounts receivable

405. All of the following can be considered the current liability of a pharmacy **EXCEPT**

- a. Accounts payable.
- b. Notes payable within 1 year.
- c. Accrued expenses.
- d. Notes payable beyond 1 year.

406. Find out the **Acid test** (quick ratio) of Manancare Pharmacy from Table 1?

- a. 202/1
- b. 1.47/1 ✓
- c. 13/1
- d. 1/1

TABLE 1

A CURRENT ASSETS

Cash	\$ 50,000
A/C receivable	\$ 75,000
Inventory	\$ 100,000
Prepaid expenses	\$ 10,000
Total current assets	\$ 235,000

B FIXED ASSETS

Fixtures and equipment	\$ 30,000
Deposits	\$ 5000
Total fixed assets	\$ 35,000

TOTAL ASSETS **\$ 270,000**

C CURRENT LIABILITIES

A/C payable	\$ 70,000
Notes payable (1 yr)	\$ 5,000
Accrued expenses	\$ 10,000
Total current liabilities	\$ 85,000

D LONG TERM LIABILITY

Notes payable (>1 yr)	\$ 20,000
Total liabilities	\$ 105,000
Net worth	\$ 165,000
Cost of goods sold	\$ 490,000

407. Which of the following does **NOT** measure the pharmacy's liquidity ?

- a. Acid test ratio
- b. Current ratio
- c. Net sales to inventory
- d. Inventory to its net working capital

408. Total liabilities to net worth ratio of **Manancare Pharmacy** is :

- a. Acceptable
- b. Below expectation
- c. Exceeds the expectation
- d. Cannot be calculated

409. The investment in **fixed assets** of MananCare Pharmacy :

- a. Exceeds the requirement
- b. Is below the requirement
- c. Meet's the requirement
- d. Cannot be calculated

410. Manancare Pharmacy wants to sell its prescription files. The Manancare Pharmacy owners asks **\$350,000** for the existing prescription file.

The Manancare Pharmacy provides the following data upon request.

Total new RX dispensed in past 2 years. **\$ 80,000**

The % of Rx that has one or more refill left **40%**

The average RX price \$ 50

Net profit % % 15

What would be your answer to the owner of the pharmacy?

- a. Price is okay.
- b. Price is too high.
- c. Price is breaking even.
- d. Cannot be calculated.

411. "Manancare Pharmacy" markdowns the price of analgesic balm from **\$3 to \$2**. If the mark down of the price increases the sales of analgesic balm from **60 tubes to 80 tubes**, what would be the coefficient of elasticity of this product ?

- a. 1
- b. 2
- c. 0.25
- d. 0.5

412. When relative change in revenue is same as the relative change in price, it is known as:

- I. Unitary elasticity
- II. Inelastic demand
- III. Elastic demand

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

413. Find out the retail price of a box of insulin syringes if the cost complement of the product is 55% and the cost of one box of insulin is \$9.00.

- a. \$4.95
- b. \$16.30
- c. \$15.11
- d. \$13.95

414. Find out the % markup of Vasotec prescription if 30 tablets of Vasotec 5 mg retail price is \$75 and the cost of the drug is \$45.

- a. 55%
- b. 75%
- c. 66%
- d. 10%

415. Find out the **retail price of one box** of insulin syringes if :

The cost of complement	= 55%
The known retail markup	= 45%
The cost of syringes	= \$9.00

- a. 4.95
- b. 13.95
- c. 16.30
- d. 15.11

416. For Manancare Pharmacy, the total rent for the whole store including the Pharmacy department is **\$10,000**. The size of the pharmacy is **600 ft²** and the size of the whole store is **5000 ft²**. On the basis of above figures, what would be the rent of the pharmacy alone?

- a. \$ 1000
- b. \$ 2000
- c. \$ 1200
- d. \$ 800

417. The funding for Medicare programs is generally obtained from:

- I. Social security taxes
- II. Premiums paid by participant
- III. State government

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

418. In a patient cost sharing plan, when a patient has to pay a specified amount of the cost of prescriptions and a third party will pay the remaining cost of prescriptions, it is known as:

- a. Copayment
- b. Coinsurance
- c. Deductible
- d. Retrospective payment

419. A person who works for an insurance company, provides the statistical data that indicates the risk associated with serving the population, and determines the premiums to cover all the estimated expenses is known as:

- a. Pharmacy manager
- b. Actuary
- c. Sponsor
- d. Vendor

420. The maximum amount that will be paid by a third party to a pharmacy when the drug is available from more than one source is defined as:

- a. Maximum allowable cost (MAC)
- b. Estimated acquisition cost (EAC)
- c. Actual acquisition cost (AAC)
- d. Average wholesale price (AWC)

421. When a patient pays a full predetermined amount to the provider at the beginning of each month it is known as:

- a. Concurrent reimbursement
- b. Prospective reimbursement
- c. Retrospective reimbursement
- d. Cash reimbursement

422. The increase in the number of taking the foreign pharmacy exam is as follows:

Year Students taking the exam.

1981	350
1982	420
1983	530
1984	600
1985	620
1986	635
1987	700
1988	850

Find out the mean of the above data:

- a. 601
- b. 588
- c. 720
- d. 520

423. What would be the median of the above example?

- a. 350
- b. 850
- c. 610
- d. 635

424. A random sample of the blood glucose concentration of 100 patients has a mean of 130 and a median of 155. The frequency distribution of the sample is:

- a. Normally distributed
- b. Positively skewed
- c. Negatively skewed
- d. Cannot be calculated

425. All of the following can be a shape of frequency of distribution **EXCEPT**:

- a. Bell shaped distribution
- b. Skewed shape distribution
- c. U shape distribution
- d. T shape distribution

✓ 426. What would be the Pearsonian coefficient of skewness if a sample has a mean of 55 and a median of 45. The standard deviation of the sample is 35.

- a. 0.90
- b. 1.0
- c. 0.85
- d. 0.35

427. Which of the following about a Binomial experiment is **NOT** true?

- a. Each trial results in an outcome that is classified as success or failure.
- b. The repeated trials are dependent upon previous experiment.
- c. The experiment generally consists of n-repeated trials.
- d. The probability of success remains constant from trial to trial.

✓ 428. What is the mean binomial distribution if the probability of success is 0.60 in 50 trials ?

- a. 5
- b. 3
- c. 8
- d. 4

✓ 429. If the blood pressure measurement of 5 people is 110, 135, 140, 125 and 115 respectively. What would be the range of the set of the above observations?

- a. 110
- b. 30
- c. 125
- d. 140

✓ 430. When plotting t distribution curves, if sample size of 20 is taken from a normal population, what would be the degree of freedom in the t distribution?

- a. 40
- b. 19
- c. 10
- d. 2

✓ 431. Find out the degree of freedom in a 2 x 3 contingency table Chi-square test when it is applied to test the hypothesis of independence of two variables?

- a. 3
- b. 2
- c. 4
- d. 1

432. The average length of time it takes students to finish an exam is 180 minutes, with a standard deviation of 36 minutes. A new examination procedure using modern computers is being tested. A random sample of 50 students had an average examination time of 150 minutes, with a standard deviation of 40 minutes under the new system. Test the hypothesis that the population mean is now less than 180 minutes. This hypothesis would result in ?

- a. One sided
- b. Two sided
- c. Three sided
- d. Cannot be calculated

433. In protein, Amino acids are joined covalently by :

- a. Hydrogen bond
- b. Peptide bond
- c. Oxygen bond
- d. Disulfide bond

434. The secondary structure of protein consists of :

- I. Alfa-helix
- II. Beta-sheet
- III. Beta-bend

- a. I only
- b. I and II only
- c. II and III only
- d. I, II, and III only

435. The denaturation of protein can occur in the presence of :

- I. Heat
- II. Strong acid
- III. Organic solvent

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

436. Which of the following about sickle cell anemia is **NOT** true?

- a. It is a genetic disorder resulting from the production of a variant hemoglobin.
- b. It is characterized with pain, lifelong hemolytic anemia and tissue hypoxia.
- c. The replacement of leucine at the sixth position of the Beta-globulin chain for glutamate is generally responsible for causing it.
- d. The form Hbs has an extremely low solubility compared to Hba which results into the aggregation of molecules that form or create sickle shaped red blood cells.

437. The enzyme with its cofactor is generally known as:

- a. Coenzyme
- b. Holoenzyme
- c. Apoenzyme
- d. Prosthetic group

438. The process in which the release of energy from energy rich molecules such as glucose and fatty acid occurs in mitochondria is known as:

- a. Oxidative decarboxylation
- b. Oxidative phosphorylation
- c. Oxidative deamination
- d. Oxidative dehydrogenation

439. The breakdown of complex molecules such as protein, lipid and polysaccharide into simple molecules such as carbon dioxide, water and ammonia is known as:

- a. Aerobic glycolysis
- b. Catabolic reaction
- c. Anabolic reaction
- d. Gluconeogenesis

440. What would be the end product of glycolysis in the cell with mitochondria ?

- a. Glucose
- b. Glycogen
- c. Pyruvate
- d. Lactate

441. Which of the following substance levels is found to be deficient in a patient with G6PD deficiency?

- a. Alfa-antitrypsin in reduced form
- b. Bradykinin in reduced form
- c. Glutathione in reduced form
- d. Trypsin in elevated form

442. Which of the following causes hemolytic anemia in patients with G6PD deficiency?

- I. Oxidant drug
- II. Ingestion of fava beans
- III. Certain types of infections

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

443. Which of the following should be classified as a disaccharide?

- a. Ribose
- b. Lactose
- c. Glycoprotein
- d. Glycosaminoglycans

444. The pairs of structure that are mirror images of each other are known as:

- a. Isomers
- b. Enantiomers
- c. Epimers
- d. Muta rotation

445. In humans, the principle storage of glycogen is found in the :

- I. Skeletal muscle
- II. Liver
- III. Spleen

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

446. Which of the following substances should be classified as a polysaccharide?

- a. Glucose
- b. Hyaluronic acid
- c. Sucrose
- d. Glycoprotein

447. Which of the following agents acts as an emulsifying agent for metabolism of lipid in duodenum?

- a. Gastric lipase
- b. Bile salt
- c. Pancreatic juice
- d. Secretion

448. Which of the following about steatorrhea is **NOT TRUE**?

- a. It causes a loss of lipid, essential fatty acid and lipid soluble vitamin in feces.
- b. The oversecretion of bile salt may impair the absorption of fat soluble vitamins.
- c. The inhibition of secretion of pancreatic juice from the pancreas generally results in steatorrhea.
- d. The absorption of vitamins such as vitamin C, thiamine, and riboflavin are not affected by the condition of steatorrhea.

449. Which of the following is a building block of membrane of nerve tissue?

- a. Prostaglandin
- b. Spingomyelin
- c. Thromboxane
- d. Leukotriene

450. The term cholelithiasis is generally referred to as:

- a. Obstruction of the stomach by cholesterol stone.
- b. Obstruction of the pancreas by cholesterol stone.
- c. Obstruction of the gall bladder by cholesterol stone.

- d. Obstruction of the spleen by cholesterol stone.

451. Which of the following is **NOT** a function of Luteinizing hormone?

- a. It initiates the testosterone synthesis in the Leydig cells of the testis.
- b. It simulates the process of spermatogenesis.
- c. It induces ovulation in females.
- d. It stimulates synthesis of progesterone and estrogen in the corpus luteum.

452. The total energy required by an individual can be found by calculating :

- I. BMR
- II. Thermic effect of food
- III. Physical activity

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

453. Which of the following is considered protein deficient malnutrition?

- I. Kwashiorkor
- II. Marasmus
- III. Steatorrhea

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

454. Which of the following is **NOT** a water soluble vitamin?

- a. Thiamine
- b. Vitamin D
- c. Niacin
- d. Pyridoxine

455. Which of the following is a good source of Vitamin K?

- a. Cabbage and cauliflower
- b. Fatty fish and liver
- c. Vegetable oils
- d. Yellow and green vegetables and fruit

456. The end product of purine catabolism is:

- a. Alantoin
- b. Uric acid
- c. Hypoxanthine
- d. Xanthine

457. The small and circular extrachromosomal DNA molecules that carry genetic information for future generations in bacteria are known as :

- a. Lysozymes
- b. Plasmids
- c. Mitochondria
- d. Cytoplasm

458. Which of the following RNA types comprises 80% of the RNA in the cell?

- I. Ribosomal RNA
- II. Transfer RNA
- III. Messenger RNA

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

459. Which of the following types of RNA carries genetic information from DNA to cytosol for protein synthesis ?

- I mRNA
- II t RNA
- III r RNA

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

460. Which of the following codons are generally known as stop or nonsense codons?

- I UAG
- II. UGA
- III. UAA

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

461. Which of the following types of microscopy is used to observe the unstained living or difficult to stain organisms?

- a. Dark field
- b. Bright field
- c. Transmission electron
- d. Scanning electron

462. The mycobacterium species of bacteria is generally stained with:

- a. Gram stain
- b. Schaeffer-fulton stain
- c. Acid fast stain
- d. Flagellar stain

463. Which of the following classes of cells have no nucleus ?

- a. Eukaryotic
- b. Prokaryotic
- c. Homokaryotic
- d. Heterokaryotic

464. Bacteria with two or more flagella is generally known as:

- a. Monotrichous
- b. Amphitrichous
- c. Lophotrichous
- d. Peritrichous

465. The moving of bacteria away from the light is known as :

- a. Chemotaxis
- b. Phototaxis
- c. Pili
- d. Escapetaxis

466. To find out if a substance is carcinogenic which of the following tests should be preformed ?

- I. Ames test .
- II. Pyrogen test
- III. Biopsy of cells

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

467. The synthesis of protein and lipids in cells is generally carried out by :

- a. Mitochondria
- b. Endoplasmic reticulum
- c. Golgi apparatus
- d. Lysozymes

468. The growth of bacteria remains constant in which of the following phases?

- a. Lag phase
- b. Log phase
- c. Stationary phase
- d. Decline phase

469. Which of the following should be considered a physical factor for growth of bacteria ?

- a. Vitamins
- b. Moisture
- c. Trace elements
- d. Carbon sources

470. When the transfer of genetic information from one cell to another cell is carried out by the plasmid, it is known as:

- a. Transformation
- b. Transduction
- c. Conjugation
- d. Transaction

471. Which of the following components of bacteriophage carries the genetic information?

- I. Genome
- II. Plate and tail fibers
- III. Tail sheath

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

472. The reduction of the numbers of pathogenic microorganisms, up to such an extent they are not able to produce any kind of disease, is known as:

- a. Sterilization
- b. Sanitization
- c. Disinfection
- d. Germicidation

473. Which of the following is/are used as antimicrobial agents?

- I. Isopropyl alcohol
- II. Phenol
- III. Hydrogen peroxide

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

474. The process of weakening the disease producing capacity of pathogens is known as:

- a. Virulence
- b. Attenuation
- c. Pathogenicity
- d. Pseudopathogenicity

475. Which of the following organisms is generally responsible for causing traveler's diarrhea ?

- a. *Cl. tetani*
- b. *E. coli*
- c. *S. aureus*
- d. *V. cholera*

476. The presence of bacteria without multiplication in blood is known as:

- a. Septicemia
- b. Bacteremia
- c. Viremia
- d. Toxemia

477. Measle is classified as a(n) :

- a. Airborne disease
- b. Waterborne disease
- c. Vector transmitted disease
- d. Direct contact disease

478. The life span of RBC is :

- a. 120 days
- b. One hour to one day
- c. 5 to 10 days
- d. 30 days

479. Which of the following cells generally guards the skin and mucous membranes against infections?

- I. Neutrophils
- II. Basophils
- III. Eosinophils

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

480. Which of the following cells are a source of production of Alfa-interferon?

- a. Fibroblasts
- b. Leukocytes
- c. T lymphocytes
- d. Natural killer

✓ **481.** Which of the following immunoglobulins provides antibody protection for the fetus?

- a. IgM
- b. IgG
- c. IgA
- d. IgE

482. Which of the following immunoglobulins are found to be elevated during asthma and other allergic diseases ?

- a. IgM
- b. IgG
- c. IgA
- d. IgE

483. The ability of the immune system to identify and respond immediately to foreign substances to which it was exposed previously is known as:

- a. Specificity
- b. Memory
- c. Heterogenicity
- d. Homogenicity

484. The production of cells in the laboratory from a clone of cultured cells that make one specific antibody to a specific epitope is known as:

- a. Polyclonal antibody
- b. Monoclonal antibody
- c. Interleukine
- d. Interferon

485. Which of the following vaccines is prepared from a toxin?

- a. Influenza
- b. Diphtheria
- c. Mumps
- d. Tuberculosis

✓ **486.** In humoral immunity, when an antigen recognized by memory cells enters the blood it is known as a:

- a. Primary response
- b. Secondary response
- c. Tertiary response
- d. Zero response

✓ **487.** The introduction of ready-made antibodies into a normal person in order to induce immunization against a particular disease is known as:

- I. Antitoxin
- II. Hyperimmune sera
- III. Immuneserum globulin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

488. All of the following can be classified as an active immunization **EXCEPT** :

- a. Mumps
- b. Antitoxin
- c. Rabies
- d. Plague

489. Hemolytic disease of a newborn in an Rh negative mother with an Rh-positive fetus is known as:

- a. Type I hypersensitivity
- b. Type II hypersensitivity
- c. Type III hypersensitivity
- d. Type IV hypersensitivity

490. Which of the following immunoglobulins is a principal mediator of type I hypersensitivity ?

TYPE - I - MEY BEVER.

- a. IgG
- b. IgM
- c. IgE
- d. T cells

491. Which of the following is **NOT** an organ specific autoimmune disorder ?

- a. Addison's disease
- b. M. gravis
- c. Ulcerative colitis
- d. Goodpasture's syndrome

492. Which of the following is a characteristic that identifies SLE ?

- a. Joint inflammation
- b. Butterfly shaped rash
- c. Muscle weakness and fatigue
- d. Severe headache with nausea and vomiting

493. The disturbance of copper metabolism may cause :

- a. Cohn's syndrome
- b. Wilson's disease
- c. Barr syndrome
- d. Cushing's syndrome

494. Which of the following osmotic diuretics is useful for treatment of cerebral edema?

- a. Thiazide diuretics
- b. Mannitol
- c. Spironolactone
- d. Acetazolamide

495. Which of the following diuretics reduces the absorption of basic drugs?

- I. Ammonium chloride
- II. Ammonium nitrate
- III. Calcium chloride

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

496. Which of the following diuretics has an aldosterone antagonist property?

- a. Hydrochlorothiazide
- b. Spironolactone
- c. Furosemide
- d. Bumetanide

497. Which of the following antacids absorbs into systematic circulation and can produce systemic alkalosis?

- a. Aluminum hydroxide
- b. Sodium bicarbonate
- c. Calcium carbonate
- d. Magnesium oxide

498. Which of the following cells take an active part in secretion of acid in the stomach?

- a. Epithelium cells
- b. Parietal cells
- c. Cells of langerhans
- d. Epidermal cells

499. Which of the following receptors are generally involved in the production of HCl in the stomach?

- I. Muscarinic receptors
- II. Histamine receptors
- III. Gastrin receptors

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

500. Which of the following factors stimulates the release of gastrin from antral G cells?

- I. Distension of stomach by food
- II. Alkaline pH of stomach
- III. Digested proteins

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

501. Which of the following prostaglandins takes an active part in the production of mucus in the stomach?

- a. Prostaglandin G
- b. Prostaglandin E₂
- c. Prostaglandin F
- d. Prostaglandin K

502. The stoppage or impaired secretion of hydrochloric acid in the stomach is known as:

- a. Dysphoria
- b. Achlorhydria
- c. Epistaxis
- d. Dyspepsia

503. Which of the following compounds have an antitussive property?

- I. Codeine
- II. Dextromethorphan
- III. Benzonatate

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

504. Overdose of heparin can be prevented by administration of :

- a. Vitamin K₁
- b. Protamine sulfate
- c. EDTA
- d. Phenobarbital

505. Which of the following drugs inhibits DNA-dependent RNA polymerase enzymes, and thus the formation of m-RNA?

- I. Actinomycin
- II. Mitomycin
- III. Rifampicin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

506. Which of the following drugs acts on replication levels of protein synthesis?

- a. Streptomycin
- b. Tetracycline
- c. Bleomycin
- d. Erythromycin

507. Which of the following are mechanisms of resistance against chemotherapy agents caused by bacteria ?

- I. Mutation
- II. Transformation
- III. Conjugation

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

508. Sulfonamide is found to be ineffective in patients with :

- a. Blood disorders
- b. Pus formation
- c. Hypoalbuminemia
- d. Slow acetylators

509. The bacteriostatic action of Cotrimoxazole is attributed to inhibition of :

- I. Dihydrofolate reductase
- II. Dihydropteroate synthetase
- III. DNA gyrase

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

510. Which of the following compounds generated by Methenamine acts as a urinary antiseptic?

- a. Hydrogen Peroxide
- b. Formaldehyde
- c. Benzaldehyde
- d. Alcohol

511. Which of the following chemotherapy agents produces its antibacterial action by inhibiting bacterial DNA synthesis by blocking DNA gyrase?

- a. Erythromycin
- b. Tetracycline
- c. Ciprofloxacin
- d. Chloramphenicol

512. Which of the following antibacterial agents is indicated for the treatment of Methicillin resistant infections ?

- a. Tetracycline
- b. Vancomycin
- c. Metronidazole
- d. Norfloxacin

513. Which of the following penicillins has an acid resistant property ?

- a. Methicillin
- b. Penicillin V
- c. Oxacillin
- d. Ticarcillin

514. The common adverse effect associated with the quinolone group of antibiotics is :

- a. Hepatic dysfunction
- b. CNS stimulation
- c. Muscle pain
- d. Ototoxicity

515. Which of the following antibiotics is indicated for treatment of UTI ?

- I. Ciprofloxacin
- II. Cotrimoxazole
- III. Nitrofurantoin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

516. Which of the following cephalosporins would be the drug of choice for treatment of meningitis?

- a. Cefaclor
- b. Ceftriaxone
- c. Cefazolin
- d. Cephalexin

517. Structure activity relationships would eliminate which of the following side effects of Ampicillin ?

- a. Anaphylactic Shock
- b. Diarrhea
- c. Hepatic necrosis
- d. Electrolyte imbalance

518. Which of the following are adverse effects of aminoglycosides?

- I. Ototoxicity
- II. Nephrotoxicity
- III. Curaremimetic effect

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

✓ **519.** Which of the following is a principal side effect of tetracycline that restricts its use in children, and pregnant woman after the second trimester?

- a. Gray baby syndrome
- b. Anaphylactic shock
- c. Defective teeth and bones
- d. Bone marrow suppression

520. Which of the following metabolite products of Streptomycin is generally responsible for causing deafness?

- a. Epianhydrotetracycline
- b. Dihydrostreptomycin
- c. Acrolein
- d. N-acetyl p-benzoquinone

✓ **521.** Which of the following is a principal adverse effect of Pyrazinamide?

- a. Renal failure
- b. Red-green color blindness
- c. Arthralgia
- d. An orange color in saliva, tears, and sputum

522. Which of the following antibiotics inhibit the synthesis of folic acid from PABA?

- a. Rifampicin
- b. Clofazimine
- c. Dapsone
- d. Isoniazid

523. If the concentration of reactant Alfa is triple in the reaction that is in second order, the rate of reaction would generally increase:

- a. 2 times
- b. 4 times
- c. 9 times
- d. 8 times

524. Which of the following pyrimidine analogs is useful in the treatment of cancer chemotherapy?

- a. Methotrexate
- b. Mercaptopurine
- c. Fluorouracil
- d. Mitomycin

525. Which of the following tests is used to find out the potency of disinfectants?

- I. Rideal-walker test
- II. Chick-martin test
- III. Moniliasis

- a. I only
- b. I and II only

- c. II and III only
- d. I, II and III only

526. Which of the following is true about alcohol as a disinfectant?

- I. Primary alcohol has less bactericidal activity compared to secondary and tertiary alcohol.
 - II. At 70% concentration, alcohol ionizes the best and provides optimum disinfection.
 - III. At 70% concentration, alcohol wets the skin smoothly and evaporates slowly.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

527. The Rideal walker coefficient of disinfectant can be calculated by :

- a. Dilution of disinfectant-killed microbes in 5 to 7.5 minutes
Dilution of formaldehyde-killed microbes in 5 to 7.5 minutes
- b. Dilution of disinfectant-killed microbes in 5 to 7.5 minutes
Dilution of phenol -killed microbes in 5 to 7.5 minutes
- c. Dilution of disinfectant-killed microbes in 5 to 7.5 minutes
Dilution of alcohol-killed microbes in 5 to 7.5 minutes
- d. Dilution of disinfectant-killed microbes in 5 to 7.5 minutes
Dilution of H_2O_2 -killed microbes in 5 to 7.5 minutes

528. The absence of the secretion of urine by the kidney is known as:

- a. Alopecia
- b. Anorexia
- c. Anuria
- d. Achlorhydria

✓ **529.** Inflammation of the lips is a frequently reported side effect of

- a. Bleomycin
- b. Isotretinoin
- c. Clindamycin
- d. Hydroxyurea

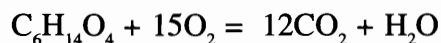
530. The copper ion Cu is represented as $^{63}_{29}\text{Cu}^{+2}$. Find out the number of neutrons in the above ion.

- a. 27
- b. 34
- c. 29
- d. 63

✓ **531.** How many iron atoms are present in ferrous sulfate? [number of moles of iron = 4]

- a. 6.02×10^{23}
- b. 2.4×10^{24}
- c. 3.5×10^{-1}
- d. 4.2×10^{-10}

532. How many molecules of $\text{C}_6\text{H}_{14}\text{O}_4$ are required to balance the equation below?



- a. 2
- b. 4
- c. 6
- d. 8

533. Find out the weight of K_2CrO_4 to prepare 250 cc of 0.5 M K_2CrO_4 solution?
[MW of K_2CrO_4 = 194.2 gm/mole]

- a. 12.20 gm
- b. 24.27 gm
- c. 97.1 gm
- d. 48.56 gm

534. 3L of N_2 gas at 5.5 atm pressure expands to a final volume of 16L. Find out the final gas pressure of N_2 in mm Hg.
[Assume that temp is constant]

- a. 1.03
- b. 783.75
- c. 365.10
- d. 135.20

535. A cylinder contains N_2 gas at 2 atm at a temperature of $30^\circ C$. The volume of gas found was 20L at this temperature. Find out the volume of gas in a liter at $50^\circ C$.
[Assume the pressure remains constant]

- a. 10L
- b. 21.3L
- c. 25.6L
- d. 45.2L

536. Find out the volume of Cl_2 (gas) occupied at a temperature of $30^\circ C$ and a pressure of 730 mm Hg. The weight of Cl_2 (gas) is 50gm.
[molecular weight = 70.91gm/mole]
[$R = 0.082 \text{ L} \times \text{atm/mole deg}$]

- a. 10.5L
- b. 12.4L
- c. 18.24L
- d. 25.5L

✓ **537.** Find out the pressure of O_2 at $125^\circ C$ if the volume of O_2 remains the same.
[Assume the gas behaves ideally at $0^\circ C$ and at 1 atm pressure.]

- a. 5.3 atm
- b. 1.45 atm
- c. 2.9 atm
- d. 12.5 atm

538. Calculate the partial pressure of H_2 if the total pressure of the mixture of gases is 10 atm and the partial pressure of He_2 is 4.6 atm.

- a. 10.0 atm
- b. 5.4 atm
- c. 4.6 atm
- d. 2.3 atm

✓ **539.** If 4.4×10^{-4} molecules of H_2 gas effuses through offices in 200 seconds, how much $N_2(g)$ would effuse through the same offices in 200 seconds?

- a. 2.1×10^{-4}
- b. 3.2×10^{-4}
- c. 1.176×10^{-4}
- d. 8.8×10^{-4}

540. How many angstroms are equal to 1 nanometer?

- a. 0.1 \AA
- b. 1.0 \AA
- c. 10 \AA
- d. 100 \AA

✓ **541.** Find out the wavelength of light from a mercury vapor lamp with a frequency of $10 \times 10^{14} \text{ HZ}$. The rate of light in a vacuum is $2.998 \times 10^8 \text{ m/s}$.

- a. 530 nm
- b. 299 nm
- c. 135 nm
- d. 480 nm

542. The molecular geometry of a CH_4 (methane) molecule is:

- a. Linear
- b. Angular
- c. Tetrahedral
- d. Trigonal bipyramidal

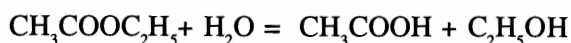
543. The transfer of molecules from a solid phase directly to a vapor phase is known as:

- a. Melting
- b. Sublimation
- c. Freezing
- d. Evaporation

544. Find out the $t_{1/2}$ of H_2O_2 , if decomposition constant in first order kinetic is 0.693×10^{-2} second⁻¹.

- a. 10 seconds
- b. 100 seconds
- c. 200 seconds
- d. 1 hour

545. The decomposition of ethylacetate in the presence of (excess) water follows the :

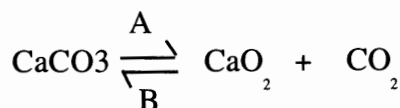


- a. Zero order
- b. First order
- c. Pseudo first order
- d. 2nd order

546. If the concentration of reactant Alfa is half in the reaction that is second order in kinetic, the rate of reaction is multiplied by factor :

- a. 8
- b. 1/4
- c. 5
- d. 1/2

547. The decomposition of Calcium carbonate in the presence of heat is as follows:



The addition of a 5 liter solution of Calcium oxide in the above mixture would change the reaction in which direction ?

- a. Direction A
- b. Direction B
- c. Remains same
- d. Cannot be predicted

548. Which of the following is the correct the way of expressing strength of the following acids in descending order ?

- a. $H_2CO_3 > HClO_4 > CH_3OH > NH_4^+$
- b. $NH_4^+ > HClO_4 > H_2CO_3 > CH_3OH$
- c. $HClO_4 > H_2CO_3 > NH_4^+ > CH_3OH$
- d. $CH_3OH > NH_4^+ > HClO_4 > H_2CO_3$

549. Find out the K_{sp} of Li_3PO_4 (0.5 gm/ 100 cc) solution.

- a. 5×10^{-9}
- b. 9.22×10^{-9}
- c. 4×10^{-9}
- d. 2.5×10^{-9}

550. The chlorination of Nitrobenzene generally results in :

- a. Ortho Chloronitrobenzene
- b. Para Chloronitrobenzene
- c. Meta Chloronitrobenzene
- d. Chlorobenzene

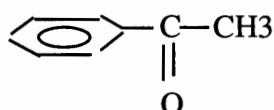
551. The nitration of benzaldehyde will result in:

- a. Meta isomer
- b. Ortho isomer
- c. Para isomer
- d. Ortho and para isomers

552. 2 Methyl 2 Propranolol is classified as a:

- a. Primary alcohol
- b. Secondary alcohol
- c. Tertiary alcohol
- d. Polyhydroxy alcohol

553. What is the IUPAC name of the following compound?

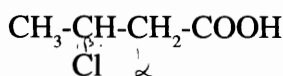


- a. Benzylphenone
- b. Acetyl phenyl ketone
- c. Acetyl benzyl
- d. Propanone

554. The oxidation of secondary alcohol generally results in:

- a. Aldehyde
- b. Acid
- c. Ketone
- d. Primary alcohol

555. The IUPAC name of the following compound is:



- a. Beta chlorobutyric acid
- b. Alfa- chlorobutanoic acid
- c. Alfa- chloropropanoic acid
- d. 2 chloropropanoic acid

556. Which of the following compounds has the lowest PKa value?

- a. Methylamine
- b. Ammonia
- c. Aniline
- d. Methylethylamine

557. Which of the following compounds produces a high concentration of H_3O^+ ions when dissolved in H_2O ?

- a. P-nitrophenol
- b. 2,4,6 trinitrophenol
- c. Phenol
- d. Ortho nitro phenol

558. The risk of teratogenesis is the highest during which trimester?

- a. First trimester
- b. Second trimester
- c. Third trimester
- d. Fourth trimester

559. Which of the following categories has shown the highest risk to the fetus?

- a. Category A
- b. Category B
- c. Category C
- d. Category X

560. Which of the following antibiotics is the drug of choice for treatment of UTI in pregnant women in their first trimester?

- a. Tetracycline
- b. SMZ/TMP
- c. Ciprofloxacin
- d. Metronidazole

561. All of the following drugs are teratogenic in nature and should be avoided by pregnant women EXCEPT:

- a. Finasteride
- b. Triretinoine
- c. Benztropine
- d. Lithium carbonate

562. Which of the following are essential fatty acids in humans?

- I. Linoleic acid
 - II. Linolenic acid
 - III. Arachidonic acid
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

563. If a patient with 30% of hematocrit lost 1000 cc of blood in a car accident, what would be the dose of iron dextran (50 mg/ml) to replace the iron loss ?

- a. 3 ml
- b. 6 ml
- c. 1 ml
- d. 2 ml

564. The principal energy-carrying molecule in a cells is:

- a. AMP
- b. ADP
- c. ATP
- d. NADP

565. Which of the following drugs can be used as an adjunctive therapy with Coumadin in a patient with cardiac valve replacement?

- a. Lidocaine
- b. Dipyridamole - *percentine.*
- c. Phenytoin
- d. Diazepam

566. Which of the following parenteral routes should be avoided with heparin?

- a. S.C
- b. I.M.

- c. I.V.
- d. Inermittent I. V.

567. Which of the following tests is widely used to monitor heparin therapy ?

- a. PTT
- b. APTT
- c. Whole blood clotting time
- d. INR

568. All of the following would increase the risk of bleeding with Coumadin therapy **EXCEPT:**

- a. Cefamandole
- b. Cimetidine
- c. Phenobarbital
- d. Chlorpropamide

569. Which of the following drugs is used for treatment of hemophilia?

- a. Aminocaproic acid
- b. Hemin
- c. Antihemophilic factor
- d. Estrogen

570. Which of the following mechanical contraceptives has shown the least risk of pregnancy?

- a. Diaphragm
- b. Vaginal sponge
- c. Condoms
- d. IUD

571. Rank the following glucocorticoids according to their expected half lives:

- a. Cortisone > Triamcinolone > Betamethasone > Hydrocortisone
- b. Betamethasone > Triamcinolone > Hydrocortisone > Cortisone

- c. Triamcinolone > Hydrocortisone
> Cortisone > Betamethasone
- d. Hydrocortisone > Betamethasone >
Cortisone > Triamcinolone

572. Which of the following corticosteroids has the highest *mineralocorticoid* activity ?

- a. Prednisone
- b. Methylprednisolone
- c. Dexamethasone
- d. Fludrocortisone

573. Aminoglutethimide is indicated for the treatment of:

- a. Bleeding disorder
- b. Cushing's syndrome
- c. Hemophilia
- d. Prostatic cancer

574. Rank the following insulins in descending order according to their duration of action:

- a. Prompt Insulin Zn > Protamine Zn >
Isophane Insulin Zn > Insulin lispro
- b. Protamine Zn Susp> Isophane insulin
Protamine Zn insulin > Insulin lispro
- c. Insulin lispro > Protamine Zn >
Prompt Zn > Isophane insulin
- d. Protamine Zn > Prompt Zn >
Insulin lispro > Isophane

575. Which of the following sources of insulins is the least antigenic in nature ?

- a. Sheep
- b. Beef
- c. Human
- d. Pork

576. "Insulin resistant" is defined as when a patient needs more than how many units of insulin per day?

- a. 80
- b. 120
- c. 180
- d. 200

577. Which of the following symptoms helps to differentiate diabetic ketoacidosis from hypoglycemia?

- I. Rapid pulse.
 - II. The presence of glucose and acetone in urine.
 - III. Acetone breath.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

578. Thyroid 1/4 grains is equivalent to:

- a. 16 mg
- b. 32 mg
- c. 65 mg
- d. 98 mg

579. What would be the volume of 5% potassium iodine that is required to mix with a 10% solution of potassium iodide to make a 7.5%, 500 cc solution of potassium iodide ?

- a. 250 cc
- b. 500 cc
- c. 150 cc
- d. 200 cc

580. Which of the following diuretics acts by inhibition of $\text{Na}^+\text{K}^+\text{ATP-ase}$ activity?

- a. Triamterene
- b. Spironolactone
- c. Amiloride
- d. Furosemide

581. How much Mannitol is present in 150 cc of 15% solution of Mannitol ?

- a. 15.0 gm
- b. 22.5 gm
- c. 44.0 gm
- d. 7.5 gm

582. If 75 ml of 25% Mannitol solution is diluted up to 800 cc with SWFI, what would be the percentage of the final concentration of Mannitol ?

- a. 23.4 %
- b. 25 %
- c. 5.6 %
- d. 2.34 %

583. Lanoxin (digoxin) can be indicated for the treatment of all of the following **EXCEPT**

- a. Atrial flutter
- b. Atrial filtration
- c. Ventricular fibrillation
- d. CHF

584. If a patient is taking Lanoxin (digoxin) for treatment of CHF and is then diagnosed with myxedema, the dose of the drug should be:

- a. Kept the same
- b. Reduced and monitored
- c. Increased and monitored
- d. Omitted

585. Which of the following is true about the toxicity associated with Digoxin ?

I. Avoid the use of potassium supplements in patients with complete heart block because of Digoxin.

II. Severe sinus bradycardia can be treated with atropine.

III. For correction of arrhythmia, lidocaine or phenytoin can be used.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

586. Which of the following adverse effects is commonly reported with the prolonged use of Amrinone?

- a. SLE
- b. Thrombocytopenia
- c. Agranulocytosis
- d. Peripheral neuropathy

587. Rank the following Nitroglycerine products according to their onset of action:

- a. Nitrostat SL > Nitrolingual spray > Nitrostat IV > Nitrodur TDS
- b. Nitrostat IV > Nitrostat SL > Nitrolingual spray > Nitrodur TDS
- c. Nitrolingual spray > Nitrostat IV > Nitrostat SL > Nitro TDS
- d. Nitrostat IV > Nitrolingual spray > Nitrostat SL > Nitrodur TDS

588. Which of the following is the correct way of administering Nitroglycerine at the first sign of acute anginal attack ?

- a. Dissolve two tablets under tongue and repeat steps every 30 mins until pain is controlled.
- b. Dissolve one tablet under the tongue at the onset of attack and repeat every 4 hours for 2 days.
- c. Dissolve one tablet under tongue at acute onset of attack, repeat every 5 minutes until complete relief is achieved. Do not exceed more than 3 tablets within a 15 minute interval.
- d. Dissolve one tablet under tongue at onset of attack and prepare patient for administration of I.V. Nitoglycerins.

589. The Cardiotoxic effects of quinidine can be reduced by administering :

- a. Sodium bicarbonate
- b. Phenytoin
- c. Sodium lactate
- d. Diazepam

590. Ringing in the ear, headache, nausea, vertigo, and vision disturbances are reported side effects of:

- a. Procainamide
- b. Phenytoin
- c. Quinidine
- d. Flecaïnide

591. Which of the following salts of Quinidine contains the highest amount of anhydrous quini-dine alkaloid ?

- a. Quinidine sulfate
- b. Quinidine gluconate
- c. Quinidine polygalacturonate
- d. Quinidine hydrochloride

592. The use of Procainamide is contraindi-cated in patients with:

- a. Arrhythmia
- b. Myasthenia gravis
- c. Ulcerative colitis
- d. Zollinger-elision syndrome

593. Which of the following drugs may pre-cipitate Lupus erythematosus-like syndrome?

- I. Procainamide
- II. Hydralazine
- III. Lidocaine

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

594. Patients with congestive heart failure have to avoid which of the following?

- a. Procainamide
- b. Phenytoin
- c. Disopyramide
- d. Lidocaine

595. Which of the following are reported side effects of Lidocaine ?

- I. Malignant hyperthermia
- II. CNS toxicity
- III. Hepatic failure

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

596. Which of the following classes of antiar-rhythmic agents is restricted only for life-threatening arrhythmia ?

- a. Class IA
- b. Class I B
- c. Class I C
- d. Class III

597. Which of the following potassium salts contains the highest meq amount of potassium?

- a. Potassium chloride
- b. Potassium bicarbonate
- c. Potassium citrate
- d. Potassium gluconate

598. Which of the following vitamin A derivatives helps with visual adaptation in darkness?

- a. Retinol
- b. Beta Carotene
- c. Retinoic acid
- d. Retinal

599. Which of the following are precursors of vitamin D?

- I. Ergosterol
- II. 7-dehydrocholesterol
- III. Dihydrotachysterol

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

600. Which of the following calcium salts has the lowest amount of elementary calcium?

- a. Calcium carbonate
- b. Calcium gluconate
- c. Calcium citrate
- d. Calcium acetate

601. Urinary alkalinizers may increase the excretion of all of the following drugs **EXCEPT**:

- a. Methotrexate
- b. Quinidine
- c. Salicylate
- d. Methenamine

602. Which of the following drugs is indicated for the removal of excess K^+ ions from blood?

- a. Calcium phosphate
- b. EDTA
- c. Sodium polystyrene sulfonate
- d. Deferoxamine

603. Which of the following drugs is indicated as an appetite stimulant agent?

- a. Epotein
- b. Megestrol acetate
- c. Pyridoxine
- d. Ensure

604. Which of the following drugs is indicated for the treatment of Benign prostatic hyperplasia?

- a. Danazole
- b. Finasteride
- c. Medroxy progesterone
- d. Mannitol

605. Which of the following is a principal adverse effect of anabolic steroids?

- a. Hypercholesterolemia
- b. Peliosis hepatis
- c. Amenorrhoea
- d. Anuria

606. Prostate cancer is known to be sensitive to:

- a. Progesterone
- b. Dihydrotestosterone
- c. Estrogen
- d. Follitropine

607. Oxytocin generally causes:

- a. Dilation of uterine muscles.
- b. Dilation of coronary arteries.
- c. Contraction of uterine muscles.
- d. Contraction of prostate gland.

608. Which of the following drugs is/are indicated for treatment of Paget's disease of bone?

- I. Alendronate sodium
- II. Etidronate disodium
- III. Tiludronate sodium

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

609. Which of the following insulins has a rapid onset of action and the shortest duration of action?

- a. Regular insulin
- b. Prompt insulin Zn
- c. Insulin lispro
- d. Insulin Zn suspension

610. Which of the following Sulfonyl urea agents should be avoided by geriatric patients ?

- a. Tolbutamide
- b. Chlorpropamide
- c. Glyburide
- d. Glipizide

611. Table sugar as source of glucose for the treatment of hypoglycemia should not be used by patients with :

- a. Metformin
- b. Acarbose
- c. Glyburide
- d. Insulin

612. Which of the following diabetic agents has the greatest risk of hepatotoxicity?

- a. Metformin
- b. Troglitazone
- c. Glyburide
- d. Insulin

613. Patients with hypersensitivity to thiazide diuretics may need to avoid:

- I. Diazoxide
- II. Metolazone
- III. Hydrochlorothiazide

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

614. Which of the following antihyperthyroid agents can be safely administered to pregnant women ?

- a. Methimazole
- b. Propylthiouracil
- c. Potassium iodide
- d. Levothyroxine

615. Which of the following is a therapeutic use of Desmopressine?

- I. Diabetes insipidus
 - II. HemophiliaA
 - III. Williebrand's disease
- a. I only
 - b. I and II only
 - c. II and III only
 - d. I, II and III only

616. Octerotide acetate generally inhibits the secretion of :

- a. Thyroid hormone
- b. Growth hormone
- c. Nor adrenaline
- d. Serotonin

617. Which of the following drugs is indicated for treatment of hyperammonemia ?

- I. Lactulose
- II. Sodium benzoate and sodium phenylacetate
- III. Methamphetamine

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

618. Prolonged treatment with Bromocriptine should be monitored through:

- a. Retina function
- b. Pulmonary function
- c. Renal function
- d. Hepatic function

619. Probenecid may elevate the serum concentration of which of the following drugs?

- I. Methotrexate
- II. Retrovir
- III. Pantothenic acid.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

620. Cyanide poisoning can be treated with:

- a. Deferoxamine
- b. Mesna
- c. Diazepam
- d. Amyl nitrite

621. Which of the following drugs should be used for treatment of Cyclophosphamide induced H.cystitis ?

- a. Dimercaptrol
- b. Leucovorin Ca
- c. Mesna
- d. Vitamin K

622. Which of the following drugs antagonizes the action of opioid drugs ?

- I. Naloxone
- II Nalmefene
- III Naltrexon

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

623. Which of the following drugs antagonizes the toxic effect of benzodiazepine overdose ?

- a. Deferoxamine
- b. Fluoxetine
- c. Flumazenil
- d. Chlorpromazine

624. Which of the following informations is **NOT** true about activated charcoal ?

- a. It is indicated for treatment of drug intoxication in an unconscious patient.
- b. It is a carbon residue derived from organic material by exposing it to an oxidizing gas compound of steam, oxygen and acid at a high temperature.
- c. Activation of charcoal surfaces increases the adsorption properties.

- d. Each gram of charcoal is capable of bind 100 mg to 1000 mg of drug.

625. Alkalinization of urine increases the bioavailability of :

- a. Propranolol
- b. Verapamil
- c. Cimetidine
- d. Flecainide

626. Which of the following Beta-blockers has Beta-1 receptor selectivity ?

- a. Pindolol
- b. Sotalol
- c. Propranolol
- d. Acebutolol

627. A positive Comb's Test helps to identify hemolytic anemia associated with:

- a. Chloramphenicol
- b. Procainamide
- c. Methyldopa
- d. Flecainide

628. Which of the following tests is employed to evaluate tablet dosage form ?

- I. Weight variation
- II. Disintegration
- III. Dissolution

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

629. Breakdown of tablets into smaller particles or granules is defined as the process of:

- a. Disintegration
- b. Dissolution

- c. Rupturization
- d. Granulations

630. Which of the following is/are processing problems for a manufacturer of tablets ?

- I. Capping
- II. Mottling
- III. Picking

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

631. Which of the following ingredients is used as a disintegrant for tablet dosage form ?

- a. Starch
- b. Lactose
- c. Talc
- d. Stearic acid

632. Which of the following ingredients increases the flow property of granules ?

- a. Acacia
- b. Corn starch
- c. Clays
- d. Mannitol

633. Which of the following diluents should be avoided with Tetracycline ?

- a. Lactose
- b. Mannitol
- c. Calcium phosphate
- d. Microcrystalline cellulose

634. For water sensitive products, which of the following diluents should be used in formulations ?

- I. Lactulose
- II. Dibasic calcium phosphate
- III. Calcium sulfate

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

635. The reaction that may be caused by certain amine drugs in the presence of lactose diluent is known as :

- a. Redox reaction
- b. Leonard reaction
- c. Millard reaction
- d. Axis reaction

636. Which of the following is an example of hydrolysed starch ?

- a. Emdex
- b. Cerelese
- c. Dextrose
- d. Avicel

637. Which of the following diluents is used for manufacturing chewable tablets ?

- a. Lactose
- b. Menthol
- c. Sorbitol
- d. Microcrystalline

638. Which of the following is/are naturally occurring gums ?

- I. Acasia
- II. Tragacanth
- III. Gelatin

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

639. Which of the following ingredients is employed as a disintegrant in the manufacturing of tablets ?

- a. Sorbitol
- b. Dibasic calcium phosphate
- c. Ac-Di-sol
- d. 50% solution of glucose

640. Which of the following is true about the coating of tablets ?

- I. It masks the taste, odor or color of the drug.
- II. It controls the release of drug from the tablet.
- III. It protects the drug from disaster effect of stomach acid.

- a. I only
- b. I and II only
- c. II and III only
- d. I, II and III only

641. Lubricants are intended to :

- a. Increase the flow property of granules.
- b. Reduce the friction between the tablet and the walls of die cavity in which the tablet is generally formed.
- c. Disintegrate particles of the tablet in the stomach.
- d. Improve the color property of drugs.

642. In which of the following drug information literature are the citations arranged alphabetically by first author and then by subject headings?

- a. Pharmacy Law Digest
- b. Clinical Pharmacy and Therapeutics
- c. Index Medicus
- d. PDR

643. Which of the following references is useful to find out which drugs have been withdrawn from the U.S. market ?

- a. AMA Drug Evaluation
- b. Drugdex
- c. D-List
- d. PDR

644. Which of the following reference sources helps for physical identification of tablets and capsules ?

- I Identidex
- II Red Book
- III Blue Book

- a. I only
- b. I and II only
- c. II and III only
- d. All

645. To find out the wholesale and retail price of particular product, one can use which of the following

- I. The American Druggist Blue Book
- II. Drug Topics Red Book
- III. DeHaen Drug Data

- a. I only
- b. I and II only
- c. II and III only
- d. All

646. Which of the following HMO models has the highest percentage of HMO membership ?

- a. Staff model HMO

- b. Group model HMO
- c. Network model HMO
- d. IPA model HMO

647. Physicians participating in IPA HMO's are normally reimbursed by

- I. Capitation
- II. Discounted FFS
- III. Salary

- a. I only
- b. I and II only
- c. II and III only
- d. All

648. 1 millimicron is equal to how many angstroms ?

- a. 1 A°
- b. 100 A°
- c. 10 A°
- d. 1000 A°

649. Which of the following is TRUE about a USP standard dropper ?

I The external diameter of the dropper must be 3 mm at its delivery end.

II When held vertically it should deliver 20 drops of water, the total weight of which is between 0.9 g and 1.1 g at 25°C.

III It was first recommended by the Brussels Conference of 1902 for international adoption.

- a. I only
- b. I and II only
- c. II and III only
- d. All

650. What is the specific gravity of 2 L of Carbon tetrachloride having a weight of 2500 gm ?

- a. 2.25
- b. 0.8
- c. 0.008
- d. 1.25

651. Which of the following is the correct unit for density ?

- a. gm/cc
- b. cc/gm
- c. gm/mm²
- d. gm cm/mm²

652. What would be the pH of the solution, if the concentration of hydrogen ions in the solution is 0.0001 g-ion/L ?

- a. 3
- b. 1
- c. 2
- d. 4

653. In a statistic, Bias refers to

- a. the closeness of measurement.
- b. the reproducibility of result.
- c. a systematic difference from the true value.
- d. All

654. Vasculitis angiitis is defined as:

- a. A sense of suffocating.
- b. A patchy inflammation of the walls of small blood vessels.
- c. An excessive variation in size between individual red blood cells.
- d. Failure of the kidney to produce urine.

655. Which of the following abbreviations is used to describe a Podiatrist ?

- a. MD
- b. DDS
- c. DPM
- d. NP

656. How much sodium bicarbonate is required to prepare 300 cc of 0.05 N solution of NaHCO₃ ?

[molecular weight = 84 gm/mole]

- a. 8.4 gm
- b. 1.26 gm
- c. 4.2 gm
- d. 0.84 gm

657. CH₂=CH₂ is classified as:

- a. SP³ hybridization
- b. SP² hybridization
- c. SP hybridization
- d. P³ hybridization

658. Which of the following bonds requires the greatest amount of energy ?

- a. C = O
- b. H-Cl
- c. C = C
- d. N-H

659. If 1 part of solute requires 10 to 30 parts of solvent, it should be defined as:

- a. Soluble
- b. Freely soluble
- c. Slightly soluble
- d. Sparingly soluble

660. Calculate the [H₃O⁺] concentration of a 0.09 M solution of ammonium chloride. Assume that K_b for ammonia is 1 x 10⁻⁴ and K_w is 1 x 10⁻¹⁴

- a. 1 x 10⁻²
- b. 2.4 x 10⁻⁵

- c. 3×10^{-6}
- d. 9×10^{-10}

661. Which of the following class of surface active agents is widely used as a preservative rather than surfactant ?

- I. Cationic agents
- II Anionic agents
- III Amphoteric agents

- a. I only
- b. I and II only
- c. II and III only
- d. All

662. The small intestine is the primary site for absorption of an orally administered drugs because

- I The intestine epithelium is more permiable to drugs than the stomach.
- II The absorptive area of the intestine is greater than that of the stomach.
- III The total blood flow through the intestine capillaries is much greater than the stomach.

- a. I only
- b. I and II only
- c. II and III only
- d. All

663. Which of the following is NOT TRUE about enzyme inhibition reactions ?

- a. They occur much more slowly than induction reactions.
- b. They are the most clinically significant type of interactions.

c. The inhibition of substrate metabolism tends to begin as soon as sufficient concentrations of the inhibitors are reached.

d. Elderly patients are at greater risk from enzyme inhibition reactions.

664. The elderly are more susceptible to which of the following conditions due to the decline in baroreceptor function ?

- a Hypertension
- b Tachycardia
- c Bradycardia
- d Orthostatic hypotension

✓ **665.** The most widely prescribed ERT for treating menopause symptoms is

- a. Estropipate
- b. Conjugated estrogen *FSH ↑ ↓*
- c. Estradiol
- d. Medroxyprogesterone

✓ **666.** As with most menopause symptoms, hot flashes are due to

- a. Estrogen deficiency
- b. Estrogen excess
- c. Progesterone deficiency
- d. Progesterone excess

667. The symptoms of BPH are caused by

- a. pressure exerted by the prostate gland on urethra
- b. relaxation of bladder muscles
- c. shrinkage of the prostate gland
- d. relaxation of the prostate gland muscles

✓ **668.** The primary cell type responsible for the long-term effects of asthma is

- a. Eosinophil
- b. Basophil
- c. T lymphocyte
- d. B lymphocyte

669. The major immunoglobulin associated with asthma is

- a. IgA
- b. IgM
- c. IgE
- d. IgG

670. Which of the following factors triggers an asthma attack ?

- I Tobacco smoke
- II Exercise
- III Cold air

- a. I only
- b. I and II only
- c. II and III only
- d. All

671. Which of the following is the clinical hallmark of asthma ?

- a. Sneezing
- b. Coughing
- c. Wheezing
- d. Dozing

672. Wheezing is defined as:

- a. a persistent cough or tightness in the chest.
- b. a high-pitched sound caused by turbulent airflow passing through an obstructed airway.
- c. a degranulation of eosinophils and release of chemical mediators.
- d. a bronchoconstriction, swelling, and an excessive mucous secretion in the airway.

673. Blood dyscrasias that affect all three blood cell lines are defined as:

- a. Thrombocytopenia
- b. Agranulocytosis
- c. Leukemia
- d. Pancytopenia

674. Which of the following drug-induced hematological disorders are associated with the highest morbidity and mortality rates ?

- a. Hemolytic anemia
- b. Leukemia
- c. Aplastic anemia
- d. Agranulocytosis

675. Which of the following drugs causes hemolytic anemia in patients with G6PD deficiency ?

- I Co-trimoxazole
- II Dapsone
- III Primaquine

- a. I only
- b. I and II only
- c. II and III only
- d. All

676. Which of the following is a sign and symptom associated with drug-induced aplastic anemia ?

- I Fatigue
- II Bruising
- III Frank bleeding

- a. I only
- b. I and II only
- c. II and III only
- d. All

677. A patient's blood report indicates granulocytes count of 1000 cells/mm^3 . This condition is defined as:

- I Granulocytopenia
- II Leukopenia
- III Agranulocytosis

- a. I only
- b. I and II only
- c. II and III only
- d. All

678. The term that normally describes for a drug that when combined with a protein renders it antigenic is

- a. Immunophilic
- b. Heptane
- c. Antiglobin
- d. Thromboxatic

679. Which of the following is the most common causative agent for Community Acquired Pneumonia ?

- a. S.pneumonia
- b. M.pneumonia
- c. S.aureus
- d. C.pneumonia

680. Which of the following is NOT TRUE about Xerostomia ?

- a. It causes dental caries.
- b. It causes difficulty in swallowing medications.
- c. It causes significant distress to patients.
- d. It contributes excessive salivation.

681. The elderly are more susceptible to which of the following conditions due to a decline in baroreceptor function ?

- a Hypertension
- b Tachycardia
- c Bradycardia
- d Orthostatic hypotension

682. Temazepam and Lorazepam are preferred benzodiazepines for use in the elderly because

- a They do not undergo phase I reactions.
- b They do not undergo phase II reactions.
- c They extensively excrete by first pass metabolisms.
- d They have limited first pass metabolism.

683. Amlodipine is classified as:

- a. Beta blocker
- b. ACE inhibitor
- c. Ca-channel blocker
- d. Vasodilator

684. An amine base that is not metabolized and has a PKa of 8 will be reabsorbed from the renal tubules most quickly if the pH of the urine is adjusted to:

- a. 5
- b. 6
- c. 3
- d. 10

685. Ten hours after 750 mg of a drug is administered by IV injection, a patient's plasma concentration is 20 mcg/ml. If the half-life of this drug is 5 hours and the minimal effective concentration (MEC) is 3 mcg/ml, how many hours after the first dose should a second dose be administered?

- a. 10 hours
- b. 22 hours
- c. 37.5 hours
- d. 15 hours

686. The following two systems were prepared without surfactant.

	System A	System B
Volume of oil	10 ml	100 ml
Droplet of radius	1 mcm	1 mcm
Interfacial tension	80dyne/cm	80dyne/cm
Volume of water	250 ml	250 ml

Which of the following statements about the thermodynamic stability of System A is true?

- It is as stable as system B
- It is 10 times more stable than system B.
- It is twice as stable than system B.
- It is 50 times more stable than system B.

687. The radioactive decay of Mobidium has a rate constant of 5×10^{-4} year. How many years will it take for 90% of the Mobidium initially present to degrade? (The amount initially present can be specified as 100%)

- 25
- 2345
- 3243
- 4606

688. A solution contains methyl acetate (0.1M) and sodium hydroxide (0.1M). If the rate constant for this reaction at 25°C is 1.082 liters (mole.min), how many minutes will it take for the concentration of methyl acetate to fall to 0.09 M?

- 1.026
- 23.45
- 132.15
- 5.43

689. The half-life of a drug is 12 days. A single 500 mg dose of the drug yields an [AUC] value

of 360 mcg/h/ml. In micrograms per milliliter, what plasma level will result at a steady state if this product is given twice a day and is 80% bioavailable?

- 10
- 45
- 30
- 76

690. A 24-hour urine sample is collected from a patient who has noninsulin diabetes mellitus and a stable creatinine level of 2 mg/dL. The sample shows a total volume of 1400 ml and a creatinine concentration of 100mg/dL. In milliliters per minute, what is the approximate glomerular filtration rate for this patient?

- 50
- 30
- 75
- 120

$$C_{cr}FR = \frac{U \times V}{P}$$

U = urine conc of creatinine
 V = vol. of urine in one min
 P = plasma conc of creatinine

691. Which of the following NSAIDs is indicated for the treatment of ductus arteriosus in pre-mature infants?

- Ibuprofen
- Indomethacine
- Rofecoxib
- Nabumetone

692. Which of the following enzymes is a rate limiting step in glycogenolysis?

- Glucose-6-phosphate
- CAMP-dependent proteinkinase
- Glycogen synthase
- Glycogen phosphorylase

693. Which of the following is the most potent estrogen in the human body?

- I Estradiol
- II Estrone
- III Estriol

- a I only
- b I and II only
- c II and III only
- d All

✓ **694.** Which of the following is NOT TRUE about Neonatal tetany?

- I It is a genetically fatal disorder.
- II It occurs in newborns of mothers with hyperparathyroidism.
- III It disappears as soon as the infant's parathyroid gland responds normally.

- a I only
- b I and II only
- c II and III only
- d All

✓ **695.** Which of the following is useful in treatment of inappropriate secretion of ADH?

- a. Doxycycline
- b. Demeclocycline
- c. Chlorpromazine
- d. Rivastigmine

696. Which of the following has the longest half-life?

- a. Ciprofloxacin
- b. Clofazimine
- c. Sulfadiazine
- d. Dicloxacillin

697. The partial supply of Controlled II drugs should be filled within

- a. 12 hours
- b. 72 hours

- c. 48 hours
- d. 4 hours

698. Which of the following drugs may be found under the Schedule II classification?

- I Fentanyl
- II Amphetamine
- III Methylphenidate

- a I only
- b I and II only
- c II and III only
- d All

699. The DEA requires that the inventory of Schedule II should be done:

- a. every week
- b. every six months
- c. every two years
- d. every five years

700. The partial dispensing of Schedule III controlled drugs should be done:

- a. every year
- b. 6 months
- c. every week
- d. 3 months

701. Which of the following auxiliary labels is/are required before dispensing Biaxin (Clarithromycin) suspension ?

- I Take with food.
- II Do not discontinue.
- III Store in refrigerator.

- a I only
- b I and II only
- c II and III only
- d All

702. A patient is taking Precose (Acarbose), 100 mg three times a day. The pharmacist has to advise the patient to regularly check his

- a. AST
- b. SGPT
- c. INR
- d. PT

703. An example of HMG-COA reductase enzyme inhibitor is/are

- I. Simvastatin
- II. Pravastatin
- III. Lovastatin

- a. I only
- b. I and II only
- c. II and III only
- d. All

704. Which of the following drug(s) is/are used for obsessive compulsive disorder?

- I. Clomipramine
- II. Imipramine
- III. Amoxapine

- a. I only
- b. I and II only
- c. II and III only
- d. All

705. A patient is using an inhaler for the first time. As a pharmacist, you would advise him to

- I. Hold the Aerochamber and shake vigorously 3 to 4 times.
- II. Breathe in slowly and deeply through the mouth until you have taken a full breath.
- III. Hold breath for 5 to 10 seconds and repeat steps.

- a. I only
- b. I and II only
- c. II and III only
- d. All

706. Ketorolac Tromethamine can be given

- I. Orally
- II. I.M.
- III. I.V.

ENSAIPS

- a. I only
- b. I and II only
- c. II and III only
- d. All

707. Which of the following is commonly used as a household oxidizing agent?

- a. Formaldehyde
- b. Benzalkonium chloride
- c. Hydrogen peroxide
- d. Ethylene oxide

708. The primary mechanism of action of Esomeprazole is

- a. H_2 receptor antagonism
- b. $5-HT_1$ receptor antagonism
- c. D_1 receptor antagonism
- d. GI. proton pump inhibition

709. Erythromycin is a choice of drug for treatment of

- a. Onychomycosis
- b. Legionnaires' Disease
- c. Herpes simplex
- d. HIV

710. Which of the following statement(s) about Talwin NX is/are true?

- I. The active ingredients of Talwin NX are Pentazocine and Naloxone HCl.

- II. It is intended for I.V. and I.M use.
- III. Naloxone HCl (0.5 mg) has profound antagonist activity when given orally.
- a. I only
b. I and II only
c. II and III only
d. All

711. All of the following drugs may raise the blood serum concentration of Theophylline EXCEPT

- a. Allopurinol
b. Primidone
c. Cimetidine
d. Ciprofloxacin

712. Which of the following drug(s) is/are indicated for treatment of chemotherapy induced nausea and vomiting?

- I. Ondansetron
II. Granisetron
III. Dolasetron
- a. I only
b. I and II only
c. II and III only
d. All

713. Mr. Keit is taking Diphenhydramine elixir to treat his allergy problem. Suddenly one night he suffers from flushing, throbbing headaches, breathing difficulty, nausea, vomiting, weakness, and blurred vision. These symptoms are because of

- a. Lorazepam
b. Protriptyline
c. Chlorpropamide
d. Diphenhydramine

714. Microorganisms that establish permanent residence without producing disease are known as:

- a. Normal flora
b. Transient flora
c. Opportunistic pathogen
d. Microbial antagonism

715. All of the following drugs are serotonin reuptake inhibitors used in the treatment of depression EXCEPT

- a. Venlafaxine
b. Paroxetine
c. Fluoxetine
d. Tranylcypromine

* **716.** Otitis media is generally caused by

- I. H. Influenza
II. S. Pneumonia
III. M. Pneumonia
- a. I only
b. I and II only
c. II and III only
d. All

* **717.** Otitis externa is generally caused by:

- a. S.aureus
b. S.epidermis
c. Paeruginosa
d. S.pyrogen

718. Mrs. Rey wants to use an Estraderm system for the first time. She comes to the pharmacist and asks how to use the transdermal system. The pharmacist may counsel her of all of the following EXCEPT

- a. The patch should be placed on a clean, nonhairy and dry area of skin.

- b. The site of the application must be rotated at least every week.
- c. The breast is the best site for the application of the patch.
- d. The system should be applied immediately after opening the patch.

719. Which of following about Didanosine is/are true?

- I. It has a more prolonged duration of action than Retrovir, with least bone marrow suppression property.
 - II. The percentages of patient survival with Didanosine is higher than with Retrovir.
 - III. Antacids may reduce or prolong the absorption of Didanosine, so an interval of at least 2 hours between administration of Didanosine and antacids is required.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. All

720. Cold sores or fever blisters are normally caused by:

- a. HSV-1
- b. HSV-2
- c. Varicella zoster
- d. Variola minor

721. Which of the following antibiotics should be avoided by patients who are suffering from G6PD deficiency?

- a. Tetracycline
- b. Penicillin

- c. Sulfonamide
- d. Cephalosporin

722. Trachoma is normally caused by:

- a. Tinea capitis
- b. Sporotrichosis
- c. *Corynebacterium diphtheria*
- d. *Chlamydia trachomatis*

723. Which of the following drugs should be used for vitamin K deficiency?

- a. Ergocalciferol
- b. Phytonadione
- c. Ascorbic acid
- d. Pyridoxine

724. Mr. X is suffering from hypersensitivity reactions with Pentazocine. Which of the following drug(s) should be avoided by Mr. X because of his allergy?

- I. Talacen
 - II. Talwin Compound
 - III. Talwin NX
- a. I only
 - b. I and II only
 - c. II and III only
 - d. All

725. Mr. Keit starts to take a Pancrelipase capsule for treatment of nutritional disorder. After one week, he lost control of his blood glucose level. When he went to the pharmacy and asked the pharmacist about his problem, the pharmacist counseled him that

- I. Pancrelipase enzyme increases the conversion of the complex carbohydrate to glucose.

II. Pancrelipase enzyme generally triggers the blood glucose level by inhibiting insulin secretion.

III. Pancrelipase enzyme increases insulin secretion.

- a. I only
- b. I and II only
- c. II and III only
- d. All

726. Which of the following medication(s) should be avoided with Ketorolac?

- I. Plicamycin
- II. Valproic acid
- III. Moxalactam

- a. I only
- b. I and II only
- c. II and III only
- d. All

727. Which of the following drug(s) is/are Angiotensin II receptor Antagonist(s) ?

- I Valsartan
- II Losartan
- III Irbesartan

- a. I only
- b. I and II only
- c. II and III only
- d. All

728. Which of the following informations is/are true about Infectious Mononucleosis?

- I. It is caused by Epstein Barr virus.
- II. It is characterized by enlarged and tender lymph nodes, an enlarged spleen, fever, sore throat and headache.

III. It is commonly spread by sneezing.

- a. I only
- b. I and II only
- c. II and III only
- d. All

729. Which of the following TCA is used in the treatment of nocturnal enuresis?

- a. Doxepin
- b. Imipramine
- c. Protriptyline
- d. Amoxapine

730. Corlopam (Feoldopam) is indicated for short-term (up to 48 hours) management of severe hypertension. It is classified a(n)

- a Alpha-1 receptors agonist
- b Beta-2 receptor agonist
- c Dopamine-D1 receptor agonist
- d Histamine-H1 receptor agonist

731. Deferoxamine mesylate is administered by

- I. I.M. route
- II. I.V. route
- III. S.C. route

- a. I only
- b. I and II only
- c. II and III only
- d. All

732. Metoclopramide produces its antiemetic effect by

- I. Inhibiting stimulation of the chemoreceptor trigger zone.
- II. Increasing G.I. motility.
- III. Increasing the rate of G.I. emptying.

- a. I only
- b. I and II only
- c. II and III only
- d. All

733. Burkitt's lymphoma is caused by:

- a. S.aureus
- b. T.pallidum
- c. Epstein Barr virus
- d. Toxoplasma gondii

734. All of the following drugs are useful in the treatment of status epileptics EXCEPT

- a. 50% dextrose solution
- b. Diazepam
- c. Phenytoin
- d. Triazolam

735. Which of the following about Trimethobenzamide is true?

- I. It is indicated for control of nausea and vomiting.
- II. It is available in caplet, injection and suppository form.
- III. No AB or AT rating is listed for Trimethobenzamide.

- a. I only
- b. I and II only
- c. II and III only
- d. All

736. Which of the following is NOT TRUE about Vibramycin?

- I. It is indicated for the treatment of SIADH.
- II. It can be safely used in renally impaired patients.

III. It may be taken with food or milk to reduce G.I. irritation.

- a. I only
- b. I and II only
- c. II and III only
- d. All

737. Sunscreen products should cover

- a. 500 nm UV light
- b. 400 nm UV light
- c. 320 nm UV light
- d. 100 nm UV light

738. Which of the following is known as the pacemaker of the heart?

- a. SA node
- b. AV node
- c. Purkinje fibers
- d. Tricupsid valve

739. Which of the following is/are true about Zofran ?

- I. It is indicated for the prevention of cancer chemotherapy induced nausea and vomiting.
- II. It is available in tablet, injection and oral solution forms.
- III. The active ingredient of Zofran is Ondansetron HCl.

- a. I only
- b. I and II only
- c. II and III only
- d. All

740. Which of the following hormones is secreted by the posterior pituitary gland?

- a. Prolactin
- b. Follicle stimulating hormone
- c. Vasopressin
- d. Luteinizing hormone

741. Which of the major serum proteins is involved in the protein binding of drugs ?

- a. Alpha-1 acid glycoprotein
- b. Lipoprotein
- c. Albumin
- d. Beta-1 acid glycoprotein

742. Which of the following is/are TRUE about Advair Discus ?

- I. It is a combination product of Fluticasone and Salmeterol.
 - II. The normal therapeutic recommended dose of Advair is twice a day.
 - III. It should be immediately used for prevention of acute attacks of asthma.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. All

743. All of the following drugs are useful dietary supplement products of pancrelipase enzymes EXCEPT

- a. Cotazym.
- b. Pancrease.
- c. Zymase.
- d. Pulmozyme.

744. Famcyclovir is generally indicated for the treatment of

- a. S. Aureus
- b. C. Albican

- c. M. Lepae
- d. H. Zoster

745. Which of the following is/are true about Pentam-300?

- I. It is mainly indicated for treatment of P. Carini Pneumonia.
 - II. Severe hypotension will be observed when given by I.M. or I.V.
 - III. Prescriptions for Pentam-300 can be filled by NebuPent.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. All

746. Mesalamine generally acts by

- a. Binding to 30^S ribosomes.
- b. Binding to 50^S ribosomes.
- c. Local bactericidal effects on colon bacteria.
- d. Inhibiting prostaglandin synthesis.

747. The normal range of prothrombin time is

- a. 1 to 5 seconds
- b. 12 to 15 seconds
- c. 20 to 30 seconds
- d. 30 to 60 seconds

748. The body mass index is calculated by:

- a. Weight (kg) / body surface area
- b. Weight (lb) / height (inches)²
- c. Weight (kg) / height (meter)²
- d. Weight (lb) / height (meter)

749. Renal clearance of phenobarbital can be increased by administering

- a. Sodium bicarbonate
- b. Sodium citrate
- c. Magnesium citrate
- d. Potassium chloride

750. Rifabutin doses should be reduced by **75%** from the recommended dose when coadministered with

- a. Lopinavir
- b. Gemfibrozil
- c. Glipizide
- d. Olanazapine

751. Severe headaches are commonly associated with

- a. Isosorbide dinitrate
- b. Furosemide
- c. Bumetanide
- d. Propranolol

752. Posicor (Mibefradil) is indicated for the treatment of

- a. CHF
- b. Hypertension
- c. Arthritis
- d. BPH

753. Which of the following is/are true about Accolate?

- I. The active ingredient of Accolate is Zafirlukast.
- II. It acts by antagonizing LTRA-receptors which are responsible for the release of SRSA.
- III. It is not a bronchodilator and should not be used for treatment of acute attacks of asthma.

- a. I only
- b. I and II only
- c. II and III only
- d. All

754. All of the following drugs are indicated in the treatment of organ transplantation as immunosuppressive agents **EXCEPT**

- a. Azathioprine
- b. Cyclosporine
- c. Tacrolimus
- d. Rocuronium

755. Which of the following is/are first-line antihypertensive agent(s)?

- I. HCTZ
- II. Atenolol
- III. Captopril

- a. I only
- b. I and II only
- c. II and III only
- d. All

756. The probable mechanism of action of Losartan is

- a. By inhibiting the enzyme which is responsible for conversion of Ace I in Ace II.
- b. By vasodilation of peripheral arteries.
- c. By blocking Alpha-1 receptors.
- d. By blocking AT type II receptors.

757. Skin protection factor (SPF) must be

- I. 5 or more, but less than 14
- II. 10 or more, but not less than 14
- III. 15 or more

- a. I only
- b. I and II only
- c. II and III only
- d. All

758. Capsosfungin is indicated to treat infections caused by

- a. Herpes virus
- b. S.pneumonia
- c. A. fungi
- d. V. cholera

759. The chance of hypoglycemia is the least when therapy is maintained with

- I. Acarbose
- II. Metformin
- III. Troglitazone

- a. I only
- b. I and II only
- c. II and III only
- d. All

760. Which of the following is/are bulk laxatives ?

- I. Metamucil
- II. Citrucel
- III. Mitrolan

- a. I only
- b. I and II only
- c. II and III only
- d. All

761. The primary mechanism of action of Pantoprazole is a

- a. H_2 receptor antagonism
- b. $5-HT_1$ receptor antagonism
- c. D_1 receptor antagonism
- d. GI. proton pump inhibition

762. Which of the following drug(s) should be avoided during Rezulin therapy?

- I. Cholestyramine
- II. Colestipol
- III. Terfenadine

- a. I only
- b. I and II only
- c. II and III only
- d. All

763. All of the following mentioned drugs produce cardiac toxicity (like cardiac arrhythmia) when given in combination with Ketoconazole **EXCEPT**

- a. Astemizole
- b. Terfenadine
- c. Loratadine
- d. Cyclobenzaprine

764. Which of the following is/are true about NSAIDs?

- I. NSAIDs are indicated for treatment of analgesia, dysmenorrhea and bursitis.
- II. GI. ulceration and bleeding have been reported with the use of NSAIDs.
- III. Any OTC NSAID should not be used more than 15 days for pain or 10 days for fever.

- a. I only
- b. I and II only
- c. II and III only
- d. All

765. Which of the following about Lovenox is/are true?

- I. The active ingredient is Enoxaprine Na.
- II. It is a low molecular weight heparin.

It is available in a 30 mg/0.3 ml injection.

- I only
- I and II only
- II and III only
- All

766. The major side effect of Cylert (Pemoline) that restricted its use in individuals is

- a. Renal failure
- b. Heart failure
- c. Liver failure
- d. Brain failure

767. The probable mechanism of action of Gabitril (Tiagabine) is

- a. Alpha-1 receptors blockage
- b. Enhanced activity of GABA
- c. Beta-1 receptor agonists
- d. Serotonin 5HT₃ receptor blockage

768. The active ingredient of Combivent is/are

- I. Ipratropium Br
- II. Albuterol SO₄
- III. Metaproterenol

- a. I only
- b. I and II only
- c. II and III only
- d. All

769. Which of the following drug(s) is/are Angiotensin type II receptor antagonist(s)?

- I Losartan
- II Irbesartan + HCTZ
- III Zileuton

- a. I only
- b. I and II only

- c. II and III only
- d. All

770. Which of the Insulins has the shortest duration of action and the fastest onset of action ?

- a. Humulin-R
- b. Lantus
- c. Humalog
- d. Novolog

771. The strength of folic acid in OTC vitamins should not exceed

- a 1 mg
- b 10 mg
- c 0.4 mg
- d 10 mcg

772. Before initiating therapy with Paclitaxel, it is recommended that the patient be pretreated with

- I. Corticosteroid
- II. Diphenhydramine
- III. H₂ Antagonist

- a. I only
- b. I and II only
- c. II and III only
- d. All

773. Which of the following drugs is contraindicated in the treatment of B.P.H.?

- I. Diphenhydramine
- II. Phenylephrine/PPA/Gauifenesin
- III. Atropin

- a. I only
- b. I and II only
- c. II and III only
- d. All

774. Sumatriptan is mainly indicated for the treatment of

- a. Cancer therapy induced nausea and vomiting
- b. Migraine
- c. Depression
- d. Seizure

775. Methicillin resistant infection would be treated by

- a. Penicillin G
- b. Cephalexin
- c. Vancomycin
- d. Ceftriaxone

776. Which of the following antihypertensive agents helps patients on diabetic treatments?

- a. Verapamil
- b. Enalapril
- c. Hydrochlorothiazide
- d. Amiloride

777. The active ingredient of Compound W is

- a. Sulfur
- b. Aspirin
- c. Salicylic acid
- d. Coal tar

778. A patient is on Antabuse for his treatment of alcohol withdrawal. Which of the following product(s) should not be taken with Antabuse ?

- I. Theophyllin Na glycinate elixir
- II. Theophyllin elixir
- III. Theophyllin tablet

- a. I only
- b. I and II only
- c. II and III only
- d. All

779. A depressed person with anxiety disorder should be treated with

- a. Doxepin
- b. Nortriptyline
- c. Fluoxetine
- d. Amitriptyline

780. The mechanism action of Fluoxetine HCl is the

- a. reuptake inhibitor of norepinephrine.
- b. reuptake inhibitor of epinephrine.
- c. reuptake inhibitor of serotonin.
- d. reuptake inhibitor of dopamine.

781. Ondansetron is mainly indicated for the:

- a. Prevention of hypertension.
- b. Prevention of nausea and vomiting induced by cancer chemotherapy.
- c. Prevention of migraine attack.
- d. Prevention of angina.

782. All of the following drugs should be avoided with Ketorolac **EXCEPT**

- a. Meclizine
- b. Cefotetan
- c. Gold compound
- d. Methotrexate

783. Which of the following hormone is secreted by the kidney in response to a reduction in the amount of oxygen that reaches tissues?

- a. Calcitonin
- b. Erythropoietin
- c. Insulin
- d. Melatonin

784. Carbamazepine is mainly indicated for

- a** Trigeminal neuralgia
- b** Arrhythmia
- c** Hypertension
- d** Depression

785. Erythromycin is the preferred agent for treatment of

- I.** Legionnaire's disease
- II.** Mycoplasma Pneumonia
- III.** Campylobacterial infection

- a.** I only
- b.** I and II only
- c.** II and III only
- d.** All

786. All of the following drugs act as anti-hyperlipidemic agents by inhibiting HMG-COA reductase **EXCEPT**

- a.** Lovastatin
- b.** Simvastatin
- c.** Fluvastatin
- d.** Clofibrate

787. After initiation of therapy, Mr. Teddy suddenly suffers from spasms of the face and neck. Which of the following drug(s) should be given to alleviate the above symptoms?

- I.** Diazepam injection
- II.** Diphenhydramine
- III.** Benztropine

- a.** I only
- b.** I and II only
- c.** II and III only
- d.** All

788. Cholestatic hepatitis is commonly associated with

- a.** Erythromycin

- b.** Erythromycin ethylsuccinate
- c.** Erythromycin stearate
- d.** Erythromycin estolate

789. Which of the following prostaglandins is a potent mediator of asthma attacks?

- a.** PGD2
- b.** PGE2
- c.** PGF2
- d.** PGI2

790. The purity of Insulin can be measured by

- a.** Content of Proinsulin
- b.** Content of Acid buffer
- c.** Separation of Dextroinsulin
- d.** Degradation of Insulin at elevated temperatures

791. Mrs. X is a pregnant woman. Which of the following antithyroid agents should be suggested by her pharmacist?

- I.** PTU
- II.** PIMA Syrup
- III.** Methimazole

- a.** I only
- b.** I and II only
- c.** II and III only
- d.** All

792. Which of the following drugs is/are dopamine receptor agonists ?

- I.** Bromocriptine
- II.** Pergolide
- III.** Tranylcypromine

- a.** I only
- b.** I and II only
- c.** II and III only
- d.** All

793. The patients should avoid sunlight when he or she is on

- I. Hydrochlorothiazide
- II. Thioridazine
- III. Tetracyclin

- a. I only
- b. I and II only
- c. II and III only
- d. All

794. Which of the following is NOT TRUE about histamine?

- a. It increases the contraction of smooth muscles.
- b. It decreases force of contraction and rate of heart.
- c. It stimulates gastric acid secretion.
- d. It is released in large amounts after skin damage.

795. The normal therapeutic blood serum concentration of Phenytoin is

- a. 10 to 20 mg/ml
- b. 10 to 20 mcg/ml
- c. 30 to 50 mcg/ml
- d. 10 to 20 mcg/ml

796. All of the following are adverse effects of gold compounds **EXCEPT**

- a. Diarrhea
- b. Abdominal pain
- c. Stomatitis
- d. Lipoatrophy

797. Which of the following antihistamine(s) is/are nonsedative antihistamines?

- I. Cetirizine
- II. Terfenadine
- III. Astemizole

- a. I only
- b. I and II only
- c. II and III only
- d. All

798. The minimum weighable quantity for class-A prescription balance is

- a. 100 mg
- b. 80 mg
- c. 60 mg
- d. 120 mg

799. Which of the following is/are true about Bupropion?

- I. It is presumed to act on dopaminergic and noradrenergic pathways involved in nicotine addiction and withdrawal.
- II. It helps reduce the urge to smoke.
- III. It helps reduce nicotine withdrawal symptoms.

- a. I only
- b. I and II only
- c. II and III only
- d. All

800. Troglitazone is mainly indicated for treatment of

- a. Hypertension
- b. Diabetes
- c. Hyperthyroidism
- d. C.H.F

801. Mr. Zec is taking Verapamil SR 240 mg for treatment of his blood pressure. The pharmacist may tell him that he must be careful using the following drugs **EXCEPT**

- a. Atenolol

- b. Digoxin
- c. Disopyramide
- d. Indomethacin

802. Which of the following drugs should not be used for more than 10 days for allergic conjunctivitis ?

- a. Ketorolac
- b. Loteprednol
- c. Azelastine
- d. Tetrahydrazone

803. The deficiency of which of the following may increase the chances of bleeding?

- a. Red blood cells
- b. White blood cells
- c. T-lymphocytes
- d. Thrombocytes

804. Which of the following drug(s) is/are responsible for pulmonary dysfunction?

- I. Bleomycin
- II. Bromocriptine
- III. Pentamidine

- a. I only
- b. I and II only
- c. II and III only
- d. All

805. Which of the following Ca-channel blockers is useful in the treatment of cerebral spasm?

- a. Amlodipine
- b. Nifedipine
- c. Nimodipine
- d. Isradipine

806. Trimethobenzamide should be avoided in patients who are suffering from

- a. Ulcers
- b. Reye's syndrome
- c. Hypertension
- d. Depression

807. Which of the following is/are Bile-acid binding resins ?

- I Cholestyramine
- II Colestipol
- III Colesevelam

- a. I only
- b. I and II only
- c. II and III only
- d. All

808. Which of the following may be damaged in Multiple sclerosis?

- a. Nephron
- b. Myelin sheath
- c. Parietal cells
- d. Bowman capsule

809. All of the following is/are true about Fentanyl TDS **EXCEPT**

- a. Fentanyl TDS system is available in 50, 75 and 100 micrograms of strength.
- b. It is contraindicated to use for management of mild to intermittent pain.
- c. A 50 micrograms per hour dose should be considered as a safe dose for initiation of therapy.
- d. Fentanyl patches should not be administered to children under the age of 12 or adults under the age of 18 whose weight is less than 110 lbs.

810. Furosemide is available in

- I. Tablet
- II. Oral solution
- III. Injection

- a. I only
- b. I and II only
- c. II and III only
- d. All

811. Which of the following NSAIDs is a pro-drug ?

- a. Diclofenac
- b. Ibuprofen
- c. Diflunisal
- d. Indomethacin

812. Valproic acid mainly acts

- a. by increasing the concentration of GABA.
- b. by decreasing the concentration of GABA.
- c. by increasing sodium influx in the brain.
- d. by decreasing firing of chloride ions in the brain.

813. The Food and Drug Administration divided drugs according to their potential to cause birth defects in 5 different categories. Which of the following categories indicates the highest risk to the developing fetus?

- a. A
- b. B
- c. C
- d. X

814. Which of the following sedative hypnotic agents is useful as an antiemetic agent for treatment of cancer chemotherapy induced nausea and vomiting?

- a. Oxazepam
- b. Clonazepam
- c. Prazepam
- d. Lorazepam

815. Which of the following glands secretes Melatonin?

- a. Pituitary
- b. Thyroid
- c. Pineal
- d. Pancreas

816. A patient has "High Cholesterol" if his total serum cholesterol value is greater than

- a. 120 mg/dl
- b. 360 mg/dl
- c. 180 mg/dl
- d. 240 mg/dl

817. The primary mechanism of action of Terazosin is a(n)

- a. beta-1 blocker
- b. alpha-1 blocker
- c. beta-2 blocker
- d. ACE inhibitor

818. A patient is allergic to Amitriptyline. Which of the following seizure drug(s) should he avoid because of his allergy problem?

- I. Carbamazepine
- II. Cyclobenzaprine
- III. Valproic acid Na

- a. I only
- b. I and II only
- c. II and III only
- d. All

819. Ketonuria is normally found in patients with/after:

- I. Diabetes mellitus
- II. Severe vomiting
- III. Starvation

- b. Aluminum
- c. Iodine
- d. Fluorine

- a. I only
- b. I and II only
- c. II and III only
- d. All

820. Which of the following is/are adverse effect(s) of Phenytoin ?

- I. Gingival hyperplasia
- II. Lupus erythematosus
- III. Ataxia

- a. I only
- b. I and II only
- c. II and III only
- d. All

821. Hydrochlorothiazide causes all of the following **EXCEPT**

- a. Hypokalemia
- b. Hypercalcemia
- c. Hypouricemia
- d. Hyperglycemia

822. Meniere's disease is characterized by:

- I. Episodes of deafness
- II. Vertigo
- III. Buzzing in the ears

- a. I only
- b. I and II only
- c. II and III only
- d. All

823. A deficiency of which of the following may lead to goiter?

- a. Magnesium

824. Which of the following antifungal agent(s) is/are useful in the treatment of oral candidiasis?

- I. Itraconazole
- II. Clotrimazole
- III. Nystatin

- a. I only
- b. I and II only
- c. II and III only
- d. All

825. Patients allergic to Cyclosporine need to avoid

- I Sandimmune
- II Gengraf
- III Remeron

- a. I only
- b. I and II only
- c. II and III only
- d. All

826. Which of the following is NOT TRUE about anorexia nervosa?

- a. It is a genetic disease characterized by severe weight loss.
- b. It is commonly reported in adult females.
- c. There is an excessive use of laxative or emetic agents.
- d. Fluoxetine is indicated for the treatment.

827. Zidovudine-induced anemia is best treated by

- I. EpoteinAlfa
- II. Filgrastim
- III. Sargamostim

- a. I only
- b. I and II only
- c. II and III only
- d. All

828. The overdose symptoms of Propoxyphene is/are

- I. Respiratory depression with cheyne stokes.
- II. Hypoxia, pinpoint pupil construction and pulmonary edema.
- III. Circulatory collapse.

- a. I only
- b. I and II only
- c. II and III only
- d. All

829. Mrs. X comes into the pharmacy to find the drug she used in Europe. Pharmacists may suggest all of the following reference materials **EXCEPT**

- a. Matriandale Extra Pharmacopoeia
- b. Index Nominum
- c. United State Adopted Name
- d. Drug's Fact and Comparison

830. Which of the following about Methyldopa is/are true ?

- I Before the treatment is initiated, it is advisable to do a blood count and periodic blood counts should be done thereafter.
- II Hemolytic anemia occurs during therapy; remit promptly upon discontinuation of the drug.

III Prolonged therapy with Methyldopa may result in a positive Comb's test.

- a. I only
- b. I and II only
- c. II and III only
- d. All

831. Hemoglobin tests measure 1 gm of Hemoglobin per

- a. 1 ml volume of whole blood
- b. 1 dL volume of whole blood
- c. 1 gm volume of whole blood
- d. 1 liter volume of whole blood

832. All of the following statements about Skelid (Tiludronate Na) are true **EXCEPT**

- a. Its active ingredient is Tiludronate sodium, useful in the treatment of Paget's disease of bone.
- b. It is available in once a day dosing.
- c. The serum alkaline phosphate level greatly reduces after initiation of therapy.
- d. It can be safely administered in renally impaired patients.

833. All of the following terms are elevated during acute attacks of asthma **EXCEPT**

- a. TLC
- b. FRV
- c. RV
- d. FEV-1

834. A female with her three-year old child comes to the front counter of the pharmacy and asks for any nausea preventing medicine for her son. She says that her son has suffered from nausea and vomiting for the past three days. The pharmacist may recommend:

- a. Emetrol for controlling nausea and vomiting for three to four times day.
- b. To admit her son immediately to the hospital.
- c. Plenty of fluid.
- d. Over the counter Meclizine.

835. A malignant disease in which the bone marrow may produce excessive amounts of leukocytes is known as:

- a. Polycythemia vera
- b. Thrombocytopenia
- c. Anemia
- d. Leukemia

836. Which of the following is/are true about PEFR measurement?

- I. The patients should measure and record PEFR twice daily for 2 weeks.
 - II. The PEFR should be measured in the morning immediately upon rising and 10 to 12 hours after the first PEF measurement.
 - III. The "personal best" PEFR is the highest PEFR found in a 2 week period.
- a. I only
 - b. I and II only
 - c. II and III only
 - d. All

837. The onset of action of Insulin Lispro is

- a. 5 to 15 min.
- b. 30 to 60 min.
- c. 8 to 16 hours.
- d. 1 to 2 hours.

838. Which of the following antihistamines is specifically used in the treatment of vertigo?

- a. Loratadine
- b. Clemastine
- c. Cetirizine
- d. Meclizine

839. The probable mechanism of action of Methotrexate is a(n)

- a. Folic acid antagonist
- b. Prostaglandin Antagonist
- c. Alpha-1 blocker
- d. Cyclooxygenase enzyme inhibitor

840. Night blindness is reported due to dietary deficiency of:

- a. Vitamin C
- b. Vitamin A
- c. Vitamin D
- d. Vitamin E

841. The process by which the hypothalamus stimulates the pituitary to release particular hormones in response to a decrease of the hormone in blood is defined as:

- a. Positive Feed-Back Mechanism
- b. Negative Feed-Back Mechanism
- c. Releasing Factor Stimulation
- d. Factor Specific Hormone Stimulation

842. Which of the following drugs is useful in the treatment of Cystic Fibrosis?

- a. Ceredase
- b. Pulmozyme
- c. Protropine
- d. Nutropine

843. Which of the following is NOT a pharmacological action of Thyroid hormones?

- a. It increases oxygen uptake, BMR, and calorie production.
- b. It stimulates carbohydrate and protein metabolism.
- c. It reduces serum concentrations of calcium by depositing blood calcium into bone.
- d. It increases heart rate.

844. Which of the following drug(s) inhibit SRSA?

- I. Zafirlukast
- II. Zileuton
- III. Cromolyn Na

- a. I only
- b. I and II only
- c. II and III only
- d. All

845. Which of the following benzodiazepines has a prolonged duration of action ?

- a. Alprazolam
- b. Triazolam
- c. Flurazepam
- d. Oxazepam

846. Saquinavir should be stored in the refrigerator; however, once brought to room temperature it can be used out within

- a. 1 day
- b. 1 week
- c. 3 months
- d. 1 hour

847. In movable joints, which of the following serves as a lubrication?

- a. Tendons
- b. Ligaments
- c. Synovial fluid
- d. Microfilaments

848. The effectiveness of Warfarin therapy can be monitored by

- a. Bleeding time
- b. Clotting time
- c. Prothrombin time
- d. Anticoagulant plasma concentration

849. Which of the following is NOT a pharmacological action of insulin?

- a. It increases utilization and oxidation of sugar in the tissues.
- b. It stimulates transports of glucose into cells.
- c. It stimulates breakdown of glycogen in muscles and the liver.
- d. It stimulates protein synthesis and growth.

850. Dryness of mouth, increased thirst, irregular heartbeat, muscle cramps or pain, nausea and weakness are signs of

- a. Digitalis toxicity
- b. Hydrochlorothiazide toxicity
- c. Bisacodyl toxicity
- d. Diazepam toxicity

851. All of the following factors stimulate insulin secretion EXCEPT:

- a. Glucose
- b. Growth hormone
- c. Glucagon
- d. Starvation

852. Digitalis glycoside increases:

- a. Influx of calcium
- b. Influx of potassium
- c. Efflux of sodium
- d. Influx of sodium

853. Which of the following drug(s) is/are indicated for treatment of accidental overdose poisoning of drugs ?

- I. Charcoal plus
- II. Actidose with sorbitol
- III. Actidose Aqua

- a. I only
- b. I and II only
- c. II and III only
- d. All

854. Calcium channel blockers are indicated for the treatment of angina because:

- I. They decrease in myocardial contractility.
- II. They reduce oxygen consumption of the heart.
- III. They reduce coronary blood flow by constricting coronary blood vessels.

- a. I only
- b. I and II only
- c. II and III only
- d. All

855. Which of the following is less likely to re-absorb from renal tubules?

- a. Glucose
- b. Water
- c. VitaminA
- d. Sodium ions

856. A patient has taken DiaBeta, (Glyburide) 2.5 mg for 6 months. He is recently diagnosed with hyperglycemia. Which of the following drugs is responsible for this elevated level of glucose ?

- a. Nifedipine extended release
- b. Omeprazole
- c. Hydrochlorothiazide
- d. Amitriptyline

857. Which of the following is NOT a side effect of vasodilators?

- a. Hypotension
- b. Tachycardia
- c. Edema
- d. Weight loss

858. Which of the following drug(s) have been reported to interact with Cimetidine?

- I. Maalox
- II. Ketoconazole
- III. Theophylline

- a. I only
- b. I and II only
- c. II and III only
- d. All

859. Which of the following ca-channel blockers has the least incidence of reflex stimulation of the sympathetic nervous system?

- I. Amlodipine
- II. Nifedipine
- III. Isradipine

- a. I only
- b. I and II only
- c. II and III only
- d. All

860. Which of the following is NOT present in lymph fluid?

- a. Lymphocytes
- b. Urea
- c. Platelets
- d. Creatine

861. Hepatic toxicity is more common with

- I. Iproniazid
- II. Phenelzine
- III. Tranylcypromine

- a. I only
- b. I and II only
- c. II and III only
- d. All

862. The principal function of the lymph node is to:

- a. Provide nutrients to cells.
- b. Remove waste material from cells.
- c. Protect cells against microbes and foreign particles.
- d. Synthesize RBC.

863. Methylphenidate SR is generally indicated for treatment of

- a. Parkinsons
- b. Weight reduction
- c. Attention deficit syndrome
- d. Pain reliever

864. Which of the following drug(s) is/are carefully prescribed with Selegiline?

- I. Meperidine
- II. Fluoxetine
- III. Tyramine

- a. I only
- b. I and II only
- c. II and III only
- d. All

865. Which of the following drugs was first approved for treatment of HIV?

- a. Saquinavir
- b. Zalcitabine
- c. Didanosine
- d. Retrovir

866. Flushing is a major complication of Niacin therapy, and can be prevented by

- I Taking Niacin with food.
- II Initiating therapy with a low dose of the drug.
- III Taking aspirin 30 minutes prior to Niacin.

- a. I only
- b. I and II only
- c. II and III only
- d. All

867. The active ingredient of Humibid LA is

- a. Dextromethorphan
- b. Codeine
- c. Guaifenesin
- d. Benzonatate

868. When a subject changes the posture from the lying down position to the upright, there is a reflex hypotension called:

- a. Systematic hypotension
- b. Asymptomatic hypotension
- c. Postural hypotension
- d. Aortic hypotension

869. Which of the following drugs is NOT an enzyme inhibitor ?

- a. Cimetidine
- b. Fluoxetine
- c. Carbamazepine
- d. Ciprofloxacin

870. The serum concentration of which of the following neurotransmitter(s) is/are increased in pheochromocytoma ?

- I. Epinephrine
- II. Norepinephrine
- III. Tyramine

- a. I only
- b. I and II only
- c. II and III only
- d. All

871. Which of the following is a reversible, nonselective MAO inhibitor ?

- a. Colesevelam
- b. Linezolid
- c. Fexofenadine
- d. Lopinavir/Ritonavir

872. Which of the following drug(s) should be avoided with Digoxin?

- I. Erythromycin
- II. Quinidine
- III. Colestipol

- a. I only
- b. I and II only
- c. II and III only
- d. All

873. Calcium Acetate is indicated for treatment of

- a. Hypocalcemia
- b. Hypophosphatemia
- c. Hypercalcemia
- d. Hyperphosphatemia

874. The principal function of bile salt is to:

- a. metabolite carbohydrates
- b. emulsify fats
- c. inhibit gastric acid secretion and motility
- d. provide alkaline pH

875. The normal therapeutic range of activated partial thromboplastin time is

- a. 12 to 14 seconds
- b. 20 to 30 seconds
- c. 35 to 45 seconds
- d. 1 to 5 seconds

876. Vancomycin Enema is indicated for treatment of infections caused by:

- a. *Cl. difficile*
- b. *C. tetanus*
- c. *P. aeruginosa*
- d. *E. Coli*

877. The normal serum plasma concentration of Potassium is

- a. 10 to 20 meq/L
- b. 3.5 to 5 meq/L
- c. 35 to 40 meq/L
- d. > 120 meq/L

878. Which of the following is a short-acting barbiturate ?

- a. Phenobarbital
- b. Amobarbital
- c. Butobarbital
- d. Pentobarbital

879. Ritonavir oral solution should be avoided with:

- a Metronidazole
- b Diphenhydramine
- c Amitriptyline
- d Alprazolam

880. Clorazepate SD is indicated for treatment of

- a. Hypertension
- b. Anxiety
- c. Insomnia
- d. BPH

881. Administration of which of the following drugs requires caution when using with Fenofibrate ?

- a Erythromycin
- b Warfarin
- c Risperidone
- d Levofloxacin

882. Which of the following drugs should be carefully prescribed with Omnicef (Cefdinir) ?

- I Aluminum hydroxide
- II Ferrous fumarate
- III Probenecid

- a I only
- b I and II only
- c II and III only
- d All

883. Zemplar (Paricalcitol) is indicated for the treatment of

- a Hypertension
- b Hyperparathyroidism
- c Diabetes
- d Glaucoma

884. How many grams of Dextrose are required to prepare 5% of 500cc solution ?

- a. 2.5 gm
- b. 25 gm
- c. 55 gm
- d. 5 gm

885. Which of the following is NOT a neurotransmitter?

- a. Epinephrine
- b. Histamine
- c. Dopamine
- d. MAO

886. How much Atropine is required to dispense 1 quart of 1 in 100 solution ?

- a. 9.6 mg
- b. 1.48 gm
- c. 2.3 mg
- d. 9600 mg

887. 20 cc of 10% KCl solution, 50 cc of 25% NaHCO₃ solution and 30 cc of 20% CaCl₂ are mixed with 5% 1000cc dextrose solution. The infusion should be administered over 8 hours. What is flow rate in drops/min ?
(I.V. set delivers = 10 drops/cc)

- a. 13.19
- b. 14.05
- c. 18.01
- d. 22.91

888. Azopt (Brinzolamide) is indicated for the treatment of

- a Hypertension
- b Edema
- c Glaucoma
- d Gout

889. To prepare 0.25% of 1000 cc Dakin solution, how many cc of 5% sodium hypochlorite are required ?

- a. 100 cc
- b. 50 cc
- c. 60 cc
- d. 40 cc

890. Tazorac (Tazarotene) topical cream is indicated for the treatment of

- I Psoriasis
 - II Acne
 - III Poison ivy
-
- a I only
 - b I and II only
 - c II and III only
 - d All

891. The extended release action of Ditropan XL (Oxybutynin ER) is attributed to its

- a. GITS system
- b. Wax matrix form
- c. Granules formulation
- d. Inner coat with outer coat

892. The initial concentration of drug decomposition according to first order kinetic is 10^{-2} units/ml. When the concentration of drug falls below 10^{-4} units/cc, it should be removed from market. What would be the expiration date for this product ?

$$[K = 2.303 \times 10^{-10} \text{ hour}^{-1}]$$

- a. 20×10^2 hours
- b. 40×10^9 hours
- c. 5×10^3 hours
- d. 40 hours

893. The major adverse effect of Doxil (Doxorubicin) is

- I. Cardiac failure
- II. Liver failure
- III. Renal failure

- a I only
- b I and II only
- c II and III only
- d All

894. If 5000 mg of triamcinolone powder are mixed with 1 lb of 1% triamcinolone cream, what is the percentage of triamcinolone in the final mixture ?

- a. 1.25 % w/w
- b. 3.56 % w/w
- c. 2.1 % w/w
- d. 4.2 % w/w

895. Which of the following drugs is indicated for the treatment of Cisplatin toxicity ?

- a. Acetylcysteine
- b. Antiplatin
- c. Amifostine
- d. Naltrexon

896. What is the osmolarity of 500 cc of 25% of sodium bicarbonate solution ?
(mw = 84 gm/mole)

- a. 5952.38
- b. 2763.18
- c. 7032.11
- d. 1809.09

897. Clotrimazole Troches are indicated for the treatment of

- a. Onychomycosis
- b. Oral candidiasis
- c. Athlete's foot
- d. Ringworm infection of groin

898. How many calories are provided by 500 cc of D₃₀W solution ?

- a. 145 calories
- b. 510 calories
- c. 325 calories
- d. 252 calories

899. The disorder of the eye in which the person can see near objects perfectly but finds it difficulty to see distance is defined as:

- a. Myopia
- b. Hypermetropia
- c. Astigmatism
- d. Photomyopia

900. How many cc of Hydrochloric acid are required to prepare 1 gallon of 2.5% hydrochloric acid ?[the purity of HCl acid = 35% w/w, the specific gravity of HCl = 1.25 gm/ml]

- a. 102.11 cc
- b. 303.15 cc
- c. 219.42 cc
- d. 151.15 cc

901. An active ingredient of Actiq is

- a. Filgrastim
- b. Fentanyl
- c. Interferon-alfa
- d. Foscarnet

902. Atacand (Candesartan) inhibits which of the following?

- a. ACE II enzyme
- b. Angiotensin II receptor
- c. CAMP enzyme
- d. Phosphodiesterase enzyme

903. What is the rate of constant after 90 minutes if the initial concentration of drug is 500 mg/cc, and 50 mg/cc after 90 minutes ? (first order kinetic)

- a. 0.051 min⁻¹
- b. 0.025 min⁻¹
- c. 0.35 min⁻¹
- d. 0.86 min⁻¹

904. The major toxicity of Foscarnet is

- I Renal failure
- II Liver failure
- III Heart failure

- a. I only
- b. I and II only
- c. II and III only
- d. All

905. How many milliequivalents of sodium are present in 480 cc of 20% sodium bicarbonate solution?

[mw sodium bicarbonate = 84 gm/mole]

- a. 960.65 meq
- b. 425.35 meq
- c. 686.66 meq
- d. 1142.85 meq

906. Which of the following is NOT a pharmacological action of adrenaline?

- a. It relaxes bronchial smooth muscles.
- b. It reduces the force of contraction of the heart.
- c. It converts glycogen into glucose in the liver.
- d. It increases the coagulation process.

907. Which of the following is/are indicated for the treatment of H. pylori infection ?

- I Omeprazole
- II Amoxicillin
- III Clarithromycin

- a. I only
- b. I and II only
- c. II and III only
- d. All

908. Which of the following is/are major adverse effect(s) of Tonocard (Tocainide) ?

- I Blood dyscrasias
- II Pulmonary fibrosis
- III Renal failure

- a. I only
- b. I and II only
- c. II and III only
- d. All

909. The extended release action of Toprol XL (Metoprolol) is attributed to its

- a. Wax matrix formulation
- b. Controlled release pellets formulation
- c. GITS
- d. Inner core with outer coat layer of drug

910. During starvation, which of the following maintain(s) the blood glucose level?

- I. Glucagon
- II. Growth hormone
- III. cAMP

- a. I only
- b. I and II only
- c. II and III only
- d. All

911. Arimidex (Anastrozole) is indicated for the treatment of

- a. Hypertension
- b. Breast cancer
- c. Onychomycosis
- d. Diabetes

912. Which of the following is NOT a pharmacological action of Glucagon?

- a. It stimulates the process of glycogenolysis.
- b. It stimulates the process of gluconeogenesis.
- c. It inhibits the deamination of amino acids.
- d. It activates adenylate cyclase to form cAMP.

913. Which of the following should be done at the initiation of Seroquel (Quetiapine) therapy ?

- a. Check for edema formation
- b. Check for cataract formation
- c. Check for blood glucose concentration
- d. Check for blood uric acid concentration

914. The extended release action of Sular (Nisoldipine) is attributed to its

- a. Wax matrix formulation
- b. GITS
- c. ORDS
- d. External coat with an internal core of drug

915. The active ingredient(s) of Tenoretic is/are

- I Atenolol
- II Chlorthalidone
- III Hydrochlorothiazide

- a. I only
- b. I and II only
- c. II and III only
- d. All

916. Zestopril (Lisinopril + HCTZ) should be avoided in patients with

- a. Sulfonamide allergy
- b. NSAID allergy
- c. Opioid allergy
- d. TCA allergy

917. If a prescription for TPN calls for providing 55% of 1500 nonprotein calories as a dextrose, how many cc of D₃₀W are required ?

- a. 451.52 cc
- b. 323.32 cc
- c. 808.82 cc
- d. 616.15 cc

918. What is the volume of dextrose solution required to prepare a peripheral parenteral nutrition that provides 1100 nonprotein calories and 30 gm of amino acids ? The formulation should provide 45% of nonprotein calories as fat and have a maximum dextrose concentration of 12.5%.

- a. 576.15 cc
- b. 823.18 cc
- c. 1423.52 cc
- d. 390.63 cc

919. Zoladex (Goserelin) is indicated for the treatment of

- a. Hypotension
- b. Prostate carcinoma
- c. Meloid leukemia
- d. Hairy cell carcinoma

920. Zomig (Zolmitriptan) is a/an

- a. 5-HT receptor agonist
- b. Dopamine receptor antagonist
- c. 5-HT₃ receptor antagonist
- d. Angiotensin II receptor antagonist

921. Zomig (Zolmitriptan) should not be prescribed to patients suffering from the following conditions **EXCEPT**

- a. Suffering from hypertension or ischemic heart disease.
- b. Taking MAO inhibitors.
- c. Taking Dihydroergotamine.
- d. Suffering from L.pneumonia.

922. When Atamet (Levodopa+ Carbidopa) is to be given to patients who are being treated with Levodopa, Levodopa must be discontinued at least

- a. 4 hours before therapy with Atamet is initiated.
- b. 8 hours before therapy with Atamet is initiated.
- c. 12 hours before therapy with Atamet is initiated.
- d. 24 hours before therapy with Atamet is initiated.

923. Permax (Pergoloid) is indicated for the treatment of

- a. Hypertension
- b. Diabetes
- c. Gout
- d. Parkinson

924. Zanaflex (Tizanidine) is a centrally acting

- a. beta-1 receptor agonist
- b. beta-2 receptor agonist
- c. alpha-1 receptor agonist
- d. alpha-2 receptor agonist

925. Allegra (Fexofenadine) is a(n)

- a. Histamine H-1 receptor antagonist
- b. Alpha-1 receptor agonist

- c. Dopamine D-1 receptor agonist
- d. Histamine H-2 receptor antagonist

926. The nasal decongestant in Allegra-D (Fexofenadine) is

- a. Epinephrine
- b. Phenylephrine
- c. Pseudoephedrine
- d. Oxymetazoline

927. Which of the following substances can the brain utilize for energy production?

- a. Fat
- b. Glucose
- c. Fatty acids
- d. Amino acids

928. Anzemet (Dolasetron) is indicated for the treatment of

- a. Hypertension
- b. BPH
- c. Prevention of nausea and vomiting associated with emetogenic cancer therapy.
- d. Diabetes

929. Anzemet (Dolasetron) therapy should be monitored by

- a. ECG
- b. CAT scan
- c. COMB's Test
- d. Antinuclear Antibody Test

930. The active ingredient of Arava is

- a. Etoposide
- b. Leflunomide
- c. Trimethoprim
- d. Voltaren

931. The most frequently reported adverse effect with Carafate (Sucralfate) is

- a. Diarrhea
- b. Vomiting
- c. Constipation
- d. Bleeding

932. Clomid (Clomiphene) is indicated for the treatment of

- a. Ovulatory dysfunction
- b. Hypertension
- c. Atherosclerosis
- d. Rheumatoid arthritis

933. DDAVP (Desmopressine) is a synthetic analogue of

- a. thyroid hormone
- b. pituitary hormone
- c. gonadotropic hormone
- d. parathyroid hormone

934. Which of the following are correct DEA numbers for Dr. Sheghi, Rama ?

- a. BS4312567
- b. AR3252181
- c. BR4530895
- d. AS2332764

935. The duration of action of Lantus (Insulin glargine) is

- a. 4 hours
- b. 1 hour
- c. 24 hours
- d. 30 minutes

936. How many sperm is/are produced from primary spermatocyte?

- a. One

- b. Two
- c. Three
- d. Four

937. Which of the following NSAIDs causes the least G.I. side effects ?

- a. Ibuprofen
- b. Naproxen
- c. Ketoprofen
- d. Rofecoxib

938. The major side effect of Vanceril (Beclomethasone) oral inhalation is

- a. Wheezing
- b. Oral candidiasis
- c. Onychomycosis
- d. Anginitis

939. Nilandron (Nilutamide) is indicated for the treatment of

- a. Breast cancer
- b. Prostate cancer
- c. Kaposi hairy cell leukemia
- d. Bone cancer

940. Patients on Nilandron (Nilutamide) therapy should wear

- a. Dark clothes
- b. Tinted glasses
- c. Very loose clothes
- d. A hat

941. Priftin (Rifapentine) inhibits which of the following ?

- a. Penicillinase enzymes
- b. DNA dependent RNA polymerase
- c. DNA gyrase
- d. 5-Lipoxygenase

942. Heparin-Induced Thrombocytopenia (HIT) can be treated with

- a. Ziprasidone
- b. Lepirudin
- c. Phenteramine
- d. Enoxaprine

943. Which of the following drugs causes a reddish coloration of the urine, sweat, sputum and tears ?

- a. Clonidine
- b. Tamsulosin
- c. Rifampin
- d. Celecoxib

944. Rifamate(Rifampin + Isoniazid) therapy should be closely monitored by regularly checking

- I Serum transaminase levels
- II Creatine clearances
- III CBC

- a. I only
- b. I and II only
- c. II and III only
- d. All

945. Synercid (Dalfopristin/Quinupristin) is indicated for the treatment of

- a. VREF bacteremia
- b. Epstein Barr virus
- c. Tuberculosis
- d. P. aureus bone infection

946. Which of the following values should be obtained before initiating therapy with Taxotere ?

- I Bilirubin
- II SGOT
- III CBC

- a. I only
- b. I and II only
- c. II and III only
- d. All

947. Therapy with Taxotere (Docetaxel) requires great caution in patients suffering from

- a. CHF
- b. Diabetes
- c. R. arthritis
- d. Seizure

948. Pentoxifylline is indicated for the treatment of

- a. R. arthritis
- b. Diabetes
- c. Peripheral Vascular Disease
- d. Pneumonia

949. Stimate (Desmopressin) is indicated for the treatment of

- a. Multiple sclerosis
- b. Cystic fibrosis
- c. Von Willebrand's disease
- d. Pulmonary embolism

950. Which of the following is the correct way to take Pancrelipase enzymes ?

- a. Take the drug on an empty stomach.
- b. When difficult to swallow, the capsule may be opened and added to food that requires chewing.
- c. Open and add the content of the capsule to applesauce and store for at least 24 hours before administering.
- d. Swallow the whole capsules with meals or snacks.

951. Which of the following drugs is indicated for the treatment of biliary cirrhosis ?

- a. Pancreatic enzymes
- b. Ursodiol
- c. Zileuton
- d. Triimipramine

952. Which of the following is/are classified as Loop diuretic(s) ?

- I Bumetanide
- II HCTZ
- III Spironolactone

- a I only
- b I and II only
- c II and III only
- d All

953. Which of the following is NOT an adverse effect of Cisplatin ?

- a. Ototoxicity
- b. Renal toxicity
- c. Hepatotoxicity
- d. Nausea and vomiting

954. Which of the following is a major side effect of Doxorubicin ? & Doxorubicin

- a. Pulmonary fibrosis
- b. Seizure
- c. Myocardial toxicity ✓
- d. Agranulocytosis

955. Poliomyelitis is classified as a:

- a Bacterial disease
- b Viral disease
- c Fungal disease
- d Protozoal disease

956. Avelox (Moxifloxacin) is similar in action to

- a. Ciprofloxacin

- b. Amoxicillin
- c. Clarithromycin
- d. Mebendazole

957. The mechanism action of Baycol (Cerivastatin) is a(n)

- a. ACE II receptor antagonist
- b. HMG-COA inhibitor
- c. 5-lipoxygenase enzyme inhibitor
- d. Leukotriene receptor antagonist

958. Which of the following is/are signs and symptoms of ketoacidosis?

- I Acetone order of breath
- II Coma
- III Extreme thirst

- a I only
- b I and II only
- c II and III only
- d All

959. Which of the following is/are causative agents for meningitis?

- I Neisseria meningitis
- II Hemophilus influenza
- III Klebseria pneumonia

- a I only
- b I and II only
- c II and III only
- d All

960. The recommended dosage and administration of K-PHOS neutral is

- a. Take a tablet on an empty stomach.
- b. Take a tablet in the early morning.
- c. Take a tablet with a full glass of water at meals and bed time.
- d. Take a tablet with antacid.

961. Which of the following drugs increases the antibacterial activity of Methenamine ?

- a. Bactrim DS
- b. K-PHOS original
- c. Lactulose
- d. Cipro

962. Which of the following drug(s) should be carefully prescribed to CHF patients ?

- I Doxorubicin
- II Esmolol
- III Daunorubicin

- a I only
- b I and II only
- c II and III only
- d All

963. Glucagon is indicated for the treatment of

- a. Diabetes
- b. Hypoglycemia
- c. Edema
- d. Shock trauma

964. Before initiating therapy with Betapace (Sotalol), patients must be checked for

- I Creatinine Clearance
- II Serum SGT level
- III CBC

- a I only
- b I and II only
- c II and III only
- d All

965. Betapace (Sotalol) should not be substituted for Betapace AF because of a significant difference between

- I Dosing administration
- II Patient Package Insert
- III Active ingredients

- a I only
- b I and II only
- c II and III only
- d All

966. Climara (Estradiol) transdermal system should be changed every

- a. 72 hours
- b. 12 hours
- c. day
- d. week

967. Which of the following drug(s) need(s) to be reduced when simultaneously administered with Quinidine ?

- I Lanoxin
- II Coumadin
- III Flecainide

- a I only
- b I and II only
- c II and III only
- d All

968. All of the following drugs are indicated for the treatment of Multiple Sclerosis EXCEPT

- a. Interferone beta-1b
- b. Baclofen
- c. Interferone beta-1a
- d. Sparfloxacin

969. Permethrine is classified as a(n)

- a. Antifungal agent
- b. Germicidal agent
- c. Scabicial agent
- d. Antiviral agent

970. Avita (Tretinoin) cream should be applied

- a. every 4 to 6 hours as needed.
- b. once a day.
- c. twice a week
- d. every 12 hours as needed.

971. The diuretic component of Clorpres is

- I Chlorthalidone
- II Metolazone
- III Hydrochlorothiazide

- a I only
- b I and II only
- c II and III only
- d All

972. Which of the following is NOT a sign of hyperkalemia ?

- a. Bradycardia
- b. Flaccid paralysis of extremities
- c. Paresthesias
- d. Leg cramps

973. Which of the following is a topical agent indicated for adjunctive therapy of patients with second and third degree burns ?

- a. Mafenide
- b. Butenafine
- c. Tolnafate
- d. Clobetasole

974. The active ingredient(s) of Aggrenox is/are

- I Aspirin
- II Dipyridamole
- III Caffeine

- a I only
- b I and II only

- c. II and III only
- d. All

975. Catapres TTS (Clonidine) patches should be replaced

- a. every 24 hours
- b. every 72 hours
- c. every 12 hours
- d. every week

976. The active ingredient of Zydys is

- a. Risperidone
- b. Olanzapine
- c. Quetiapine
- d. Lithium

977. If PKa of a weak base is 9, what would be the PKb?

- a. 9
- b. 14
- c. 5
- d. 1

978. Flomax (Tamsulosin) is indicated for the treatment of

- a. Hypertension
- b. BPH
- c. Cystic fibrosis
- d. Diabetes

979. The mechanism action of Micardis (Telmisartan) is a(n)

- a. Beta-1 blocker
- b. Alpha-2 blocker
- c. Angiotensin II receptor blocker
- d. Beta-2 blocker

980. Patients with hypersensitivity to Aspirin should avoid

- a. Mitomycin
- b. Irbesartan
- c. Meloxicam
- d. Abacavir

981. Dipyridamole is a(n)

- a. ACE inhibitor
- b. Platelet adhesion inhibitor
- c. HMG COA inhibitor
- d. Monoamine Oxidase inhibitor

982. Serentil (Mesoridazine) is available as a(n)

- I. Tablet
- II. Concentrate syrup
- III. Injection

- a. I only
- b. I and II only
- c. II and III only
- d. All

983. Hectorol (Doxercalciferol) is indicated for the treatment of

- a. Hypothyroidism
- b. Cretinism
- c. Acromegaly
- d. Hyperparathyroidism

984. Phoslo (Calcium acetate) is indicated for the treatment of

- a. Hypocalcemia
- b. Hyperuricemia
- c. Hyperphosphatemia
- d. Hyperkalemia

985. Children suffering from Reye's syndrome should avoid

- a. Acyclovir

- b. Aspirin
- c. Ketoconazole
- d. Famcyclovir

986. The active ingredients of Avalide is/are

- I Irbesartan
- II Hydrochlorothiazide
- III Telmisartan

- a I only
- b I and II only
- c II and III only
- d All

987. The principal side effect of Glucophage (Metformin) is

- a. Glomerulonephritis
- b. Lactic acidosis
- c. Pulmonary fibrosis
- d. S.L.E.

988. Glucophage (Metformin) normally does what?

- I. Decreases hepatic glucose production.
- II. Decreases intestinal absorption of glucose.
- III Stimulates beta cells of langerhans.

- a. I only
- b. I and II only
- c. II and III only
- d. All

989. Plavix (Clopidogrel) is indicated for the treatment of

- a. Diabetes
- b. Hypertension
- c. Myocardial infarction
- d. R. arthritis

990. Pravachol (Pravastatin) should preferably be administered

- a. in the evening.
- b. in the morning.
- c. before bed time.
- d. any time of the day.

991. Serzone (Nefazodone) is indicated for the treatment of

- a. diabetes
- b. depression
- c. angina
- d. hypertension

992. Which of the following opioid drugs is available in nasal spray ?

- a. Morphine sulfate
- b. Butorphanol
- c. Fentanyl
- d. Propoxyphene

993. Pulmonary fibrosis is the most severe adverse effect associated with

- a. Cyclosporine
- b. Bleomycin
- c. Daunorubicin
- d. Taxotere

994. The CFTR protein is responsible for:

- a. Transfer of amino acids
- b. Transfer of glucose
- c. Transfer of potassium ions
- d. Transfer of chloride ions

995. Droxia (Hydroxyurea) is indicated for the treatment of

- a. Testicular carcinoma
- b. Sickle cell anemia

- c. Prostate cancer
- d. Hodgkin's lymphoma

996. What is the ratio of unionized species to ionized species of a weak base if the pH of the solution is 10 and PKa is 8.

- a. 1:100
- b. 100:1
- c. 1000:100
- d. 10:100

997. Which of the following is the major cholesterol-carrying lipoprotein in human plasma?

- a. LDL
- b. VLDL
- c. HDL
- d. Chylomicron

998. Which of the following is the active ingredient of Mesnex (Mesna) ?

- a. Na-2mercaptoethane sulfonate
- b. 2-p-chlorophenylethane
- c. 3-cyclohexyl 1-nitrosourea
- d. 1-napthalene-hepatonic acid

999. With glycogen storage disease, which of the following enzymes is absent?

- a. Azo reductase
- b. Alanine transferase
- c. Myophosphorylase
- d. Predeoxycarboxylase

1000. Which of the following is a major dose related side effect of Carboplatin ?

- a. Nausea and vomiting
- b. Pulmonary fibrosis
- c. Seizure
- d. CHF

ANSWERS

1 (b) Benzyl alcohol is classified as a preservative. Preservatives prevent the growth of microorganisms and prevent deterioration of pharmaceutical dosage forms. The ideal preservative must have the following characteristics:

It must be effective against a broad spectrum of microorganisms. It must be stable for the lifetime of the product. It must be nontoxic, soluble, palatable in test and odor and compatible with other ingredients in the formulation.

Commonly used preservatives:

- | | |
|------------------|-------------------|
| * phenol | * benzoic acid |
| * benzyl alcohol | * chlorobutanol |
| * thiomersal | * benzalkonium |
| * cresol | * cetylpyridinium |

2 (c) Cold cream is an example of W/O emulsion. It is a biphasic liquid dosage form, in which disperse phase and the dispersion medium are liquids. Emulsion is classified by five different categories:

Water in Oil (W/O) : Oil is continuous phase and water is a disperse phase, i.e. lotions and liniments.

Oil in water (O/W) : Water is continuous phase and oil is a dispersed phase i.e. most of the oral emulsions to unmask the oil taste of a medication.

Microemulsion : Unlike emulsions, microemulsion is a transparent with a small particle size. It is believed to be thermodynamically unstable. The particle size of microemulsion lies between 10 to 200 nm. It is generally used for the solubilization of the drug in pharmaceutical dosage form.

Nanoparticles : As the name suggests, the particle size of this kind of emulsion is limited to nanograms. They are useful for the preparation of globulins and toxoids. Tetanus toxoid and human immunoglobulin G are examples of nanoparticles emulsion.

Multiple emulsions : Water in Oil in water (W/O/W), Oil in water in Oil (O/W/O). The w/o/w emulsions are generally more preferable for preparation of various pharmaceutical dosage forms. They are used to prolong the duration of action of various drugs, to localize drug in the body and to prepare cosmetics.

3 (a) Egg yolk or egg white is useful as an emulsifying agent. It lowers the interfacial tension between disperse phase and dispersion medium. It can be classified as natural or synthetic.

Commonly used emulsifying agents:

- | | |
|--------------------------|-------------------|
| * Acacia | * Tragacanth |
| * Gelatin | * Methylcellulose |
| * Pectin | * Agar |
| * Spans | * Tweens |
| * Sodium lauryl sulfate. | |

4 (c) The transfer of a drug from a high concentrated area to a low concentrated area is defined as "Diffusion".

The addition of a levigating agent into a solid to blend to make paste is defined as "Levigation" i.e. the addition of glycerine to the powder of sulfa.

5 (b) The most suitable route for administration of insulin is subcutaneous, since it has been found that absorption of insulin via this route is slow and therefore the chance of acute hypoglycemia is very rare.

6 (b) Noyes Whitney equation helps to find out the rate of dissolution of a drug. The rate of dissolution is a rate-limiting step in the drug's bioavailability.

$$\frac{dC}{dt} = \frac{Dc S}{h} (C_s - C)$$

- C : Concentration of drug at time t
Dc : Diffusion coefficient of drug
S : Surface area of drug particles
Cs : Solubility of drug in diffusion layer
h : Thickness of the diffusion layer surrounding the particles

7 (a) A substance that may be exhibited in more than one type of crystal structure is known as Polymorphism and different structures are known as polymorphous i.e Theobroma oil, diamonds and methylprednisolone.

8 (b) The minimum concentration of a drug at the receptor site which initiates pharmacological action is defined as Minimum Effective Concentration (MEC). Ideally drug concentration should be between MEC and MTC. Other terminology includes :

MTC : Defined as the minimum toxic concentration. The concentration above MTC produces adverse and toxic effect.

Tmax : Time to reach maximum concentration (Cmax) in a blood.

9 (a) Area Under Curve (AUC) provides information about the amount of drugs that are systematically absorbed.

10 (c) Albumin is the major plasma protein involved in binding of drugs. Drug binding inhibits the clearance of the drug from the liver and kidney. It limited the availability of free drugs to various receptor sites.

Profound increase in drug binding may reduce the effects of the drug or decrease in drug binding may increase the toxic or adverse effects of drugs.

Drugs having a high affinity for protein binding may displace a low affinity for protein binding, such as oral sulfonylurea displaces the coumadin from protein binding.

* Factors that affect protein binding :

- I Hypoalbuminemia
- II Renal impairment and uremia
- III Pregnancy- protein binding is decreased in last trimester of pregnancy.
- IV Age-protein binding is less in neonant and children.

11 (c) The hypothetical volume of distribution of drug can be calculated on the basis of following formula : $V_d = \frac{P}{C_p}$

- Vd = Volume of distribution
P = Amount of drug in the body
Cp = Plasma concentration of drug

The volume of distribution is very useful in estimating the plasma concentration of the drug when the amount of drug is known. It helps to establish the dose of drug to achieve the specific plasma concentration of drug. It is a direct measure of the extent of distribution. Drugs that are highly bound to plasma protein have a less V_d and vice versa. This indicates that drugs with high protein binding capacity may distribute less in tissues and other body fluids. Likewise, if the drug is extensively distributed in the tissues and body fluids, V_d would be high.

12 (a) The initial dose of a drug through I.V. bolus to achieve desirable plasma concentration at once is defined as the Loading dose of drug. The replacement of metabolic loss of a drug from time to time to sustain the minimum effective concentration of drug (MEC) is defined as a maintenance dose.

13 (b) The creatinine (endogenous substance obtained from creatinine phosphate during muscle metabolism) and Inulin (exogenous substance, a polysaccharide) are useful to measure the rate of glomerular filtration.

The ideal characteristics of a drug to measure glomerular filtration rate :

- * It must be nontoxic and non-reabsorbable from the renal tubules.
- * It must not affect the renal function.
- * It should be actively secreted through renal tubules and should be easily measured in urine or plasma.
- * It should not be metabolized by the liver.

Creatinine clearance is the most widely acceptable test to measure the function of kidney. Normal creatinine clearance lies between 80 to 120 cc/min. Creatinine clearance below 60 cc/min indicates renal function impairment.

14 (b) The rapid degradation of drugs by liver enzymes is known as the First Pass Effect of metabolism.

15 (b) The normal creatinin clearance value lies between 80 to 120 cc/min.

16 (b) Sucrose is an example of Oligosaccharide. It consists of a short chain of monosaccharide. It consists of one molecule of glucose and one molecule of fructose. Carbohydrates can be divided into three categories : Monosaccharide, Oligosaccharide and Polysaccharide.

Monosaccharides : They are simple sugar such as glucose or fructose.

Oligosaccharides : Consists of a small chain of monosaccharides. i.e. sucrose, maltose and lactose. They have to degraded into simple sugar in order to be absorb from the intestine. Degradation of sucrose gives one molecule of glucose and fructose, degradation of maltose gives two molecules of glucose, and degradation of lactose gives each molecule of galactose and glucose.

Polysaccharides : They consist of long chains of monosaccharides i.e. starch and glycogen

17 (c) Uracil. It is a pyrimidine base that only found on RNA.

Nucleotides are the building blocks of the nucleic acid. Purines and pyrimidines bases bind to ribose to form nucleoside, which when binded to phosphoric acid forms the nucleotides.

	<u>DNA</u>	<u>RNA</u>
<u>Purine bases</u>		
Adenine	√	√
Guanine	√	√
<u>Pyrimidine base</u>		
Cytosine	√	√
Uracil		√
Thymine	√	

18 (a) Heparin is classified as a heteropolysaccharide. Polysaccharides are classified in two different categories :

- I Homopolysaccharide
- II Heteropolysaccharide

Homopolysaccharide: Consist of only one type of monomeric units i.e. starch, glycogen, cellulose.

Heteropolysaccharides: Consist of two or more types of monomeric units, i.e. heparin and hyaluronic acid

19 (c) qRNA. Nucleic acids consist of long chains of nucleotides. They can be subdivided into two different categories:

- I DNA (Deoxyribose nucleic acid)
- II RNA (Ribose nucleic acid)

RNA is subdivided into three categories:

- I rRNA (Ribosomal RNA)
- II mRNA (Messenger RNA)
- III tRNA (Transfer RNA)

rRNA : It is found in association with a number of proteins as the component of ribosomes. It helps in the synthesis of protein. 80% of RNA in the cell consists of rRNA.

mRNA : It is known as messenger RNA. As its name suggests it conveys the specific genetic information from DNA to the cytosol to prepare the site for specific protein synthesis. 5 % of RNA in the cell consists of mRNA.

tRNA : It is known as transfer RNA. It makes about 15% of RNA in the cell. Each tRNA carries the specific amino acid to the site of protein synthesis. Each tRNA molecule contains anticodon (three base nucleotide sequences) that generally recognize the codon on mRNA.

20 (a) Mitochondria is the host for Krebs's cycle. It is known as the powerhouse of the cell. A series of oxidative reactions occur in mitochondria, and energy from such reactions is stored as ATP. Energy in the form of ATP is usable by cells for their activities.

The Golgi apparatus consists of a stack of flattened membrane sacs. It helps in storing various substances transformed from the endoplasmic reticulum in a small secretory vesicle. These vesicles fuse to the plasma membrane and secrete the contents of vesicles into the extracellular portion of cells. The Golgi apparatus also helps in the formation of plasma and the lysosome membrane.

Lysosomes are extremely small organelles made by the Golgi apparatus. They contain digestive enzymes that help in digestion of starch, glycogen and fat. They fuse with vacuoles (cells that store glycogen, starch and fat) and release digestive enzymes into vacuoles.

A cell nucleus is absent in prokaryotic cells. It is only found in eukaryotic cells.

In the cytoplasm, one can see tubes and a plate like structures distributed all over the cell which known as the endoplasmic reticulum. It can be smooth or rough. Smooth endoplasmic reticulum helps in the synthesis of lipids. Rough endoplasmic reticulum has numerous ribosomes that attach to its surface and which give it a rough texture. Rough endoplasmic reticulum helps in synthesis of proteins.

21 (b) The synthesis of glucose from sources other than carbohydrates is known as gluconeogenesis. The other choices include :

Glycolysis: Breakdown of sugar into pyruvate or lactate.

Glycogenesis: The synthesis of glycogen from glucose.

Glycogenolysis: The breakdown of glycogen into glucose.

22 (d) All. The lists of the essential amino acids includes :

- * Isoleucine
- * Arginine
- * Methionine
- * Leucine
- * Lysine
- * Threonine
- * Tryptophan
- * Valine
- * Phenylalanine
- * Histidine

23 (b) DNA ligase catalyzes the coupling of two molecules of DNA. DNA transferase catalyzes the transfer of various groups such as phosphate and amino groups. DNA hydrolases hydrolyses the various substances. DNA lyase catalyzes the

removal of various functional groups other than the process of hydrolysis. DNA isomerase catalyzes various isomerizations.

24 (b) Nucleotides are the building blocks of nucleic acid. Nucleic acids consists of long chains of nucleotides.

25 (b) B lymphocytes and T lymphocytes are the primary cells of immune responses of the body.

26 (c) Immunoglobulins are protein of the antibodies class. They can be subdivided into five major categories.

IgG: It is the major immunoglobulin found in blood. It accounts for 75% of the serum immunoglobulin and 20% of plasma protein. It is the only immunoglobulin that can cross the placental barrier to provide protection to the fetus. It is the only class of immunoglobulin whose Fc region can be recognized by phagocytosis and NK cells.

IgM: It is the first immunoglobulin produced by the body in response to antigen. It accounts for 5 to 10% of total immunoglobulins. It is the first immunoglobulin that is formed by the fetus, however it cannot cross the placenta due to its large size.

IgA: It is the major immunoglobulin in external body secretions such as saliva, tears and urine. It accounts for 10% of total immunoglobulins.

IgE: This immunoglobulin plays an important role in combating helminth and allergy reactions produced such as drugs, pollens or foods. The level of this immunoglobulin is found to be highly elevated in patients with allergy condition such as asthma and hay fever.

IgD: It accounts for 1% of total immunoglobulins. It serves as an antigen receptor site in the early stages of immune response.

27 (d) U test. Arm ratio test, Rider and graduated beam test and shift test are commonly employed tests for checking sensitivity of class A prescription balance. The minimum weighable quantity for class A prescription balance is 120 mg.

28 (a) The ratio of the mass of an object measured in a vacuum at a specific temperature to the volume (in ml) of an object at the same temperature is defined as Absolute density.

Specific gravity : The ratio of the mass of a substance to the mass of an other substance an equal volume taken as standard.

Relative density : The mass of 1 ml of a standard substance at a specified temperature, relative to water at 4⁰ C.

Apparent density : The ratio of mass of an object measured in air at specific temperature to the volume of the object in ml at the same temperature.

29 (c) The mean blood pressure of Mr. Ham can be calculated as follows:

$$\frac{80 + 82 + 81.5 + 90 + 85 + 83}{6} \\ = 83.58$$

30 (b) The deviation of data from its mean or average is defined as standard deviation. The reproducibility of the series of measurements is known as precision. Accuracy is defined as closeness of measurements to the true value.

31 (a) The reproducibility of results of a number of experiments is generally known as precision.

32 (b) The sum of the all probabilities (failure and success) in binomial distribution is equal to 1, therefore if the probability of success is $p = 0.6$, the probability of failure (q) should be 0.4.

$$\begin{aligned}p + q &= 1 \\q &= 1 - p \\&= 1 - 0.6 \\&= 0.4\end{aligned}$$

33 (c) The alfa-error in "Null Hypothesis" is also known as level of significance. It commonly is chosen as 5%. This means that the error should be considered as significant if the difference between observed value and hypothetical value is more than 5%. The more conservative approach would be to chose at the level of 1%.

The second type of error is defined as beta error. It is defined as no difference between observed value of parameter and hypothetical value of parameter.

For example, if we assume that Mr. Raj's blood pressure should be 100 mm Hg, we can say that hypothetical value of experiment is $H_0 = 100$.

Alternative is could include all values greater than or less than 100 upon actual measurement of blood pressure. If the measured value of blood pressure is 100, we can say that beta error occurs, and if it is less than 95 or greater than 105 (5% difference), it would be considered as alfa-error.

34 (b) When the hypothetical value of a parameter is the same as the observed value of a parameter, the error should be considered Beta error.

35 (a) The degree of freedom in a chi-square test is defined as $(R-1) \times (C-1)$, therefore the degree of freedom in 2×2 contingency table would be $(2-1) \times (2-1) = 1$.

36 (b) The "F" distribution is used to compare two variances. It is defined by the ratio of variances, with $n_1 - 1$ in the numerator and $n_2 - 1$ in the denominator of the ratio. The "t" distribution is useful for a comparison of two means.

37 (b) Fluorine has the highest electronegativity compared to other given choices.

38 (d) In the figure IV F atom is more negative than the C atom and therefore electrons are displaced more towards F atom. This will make the molecule more polar.

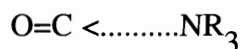
The F atom has more electronegativity than Cl, H and CH₃, therefore the correct choice would be "d".

In the choice "C" two "F" atoms stand opposite to each other and nullify each other effects.

39 (a) The high boiling point of H₂O (100^o) compared to H₂S (-60^o) and H₂Se (-41^o) is attributed the ability of O to make more H-bonds compared to S and Se. The strength of the most H-bond ranges from 1 to 7 kcal/mole.

Hydrogen bonding is also responsible for higher solubility of polyhydroxy compounds.

40 (b) Due to electrostatic attraction, the negative pole of one molecule will try to line up with the positive pole of neighboring molecule.



This type of attraction is known as dipole-dipole attraction and has a strength of 1 to 7 kcal/mole.

Sometimes electrons are concentrated in one region of the atom or molecule, and this displacement of electrons generally causes a nonpolar molecule to become a polar molecule which results in an instantaneous dipole. Slowly, electrons in a neighboring atom or molecule may be displaced to produce a dipole this is called process of induction. A newly formed dipole is known as an induced dipole or debey force. Debey force has a strength of about 1 to 3 kcal/mole.

The attraction between two induced dipole molecules is known as dipole-induced dipole interaction, dispersion force or London force, This

bond has a strength of about 0.5 to 1 kcal/mole. Ion dipole or ion induced dipole bond; in a polar substance, the positive end of one dipole tries to line up with the negative end of an other dipole.

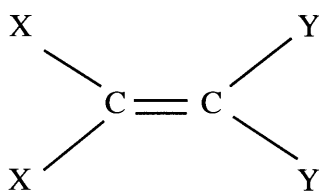
Hydrophobic bond: The association of nonpolar groups in an aqueous solution such as water, due to the tendency of aqueous solvents to exclude nonpolar molecules.

41 (c) The process of transforming a solid to a vapor without intermediate change to the liquid is defined as sublimation. The transform of solid to a liquid is defined as melting and the transfer of liquids to a vapor is defined as evaporation.

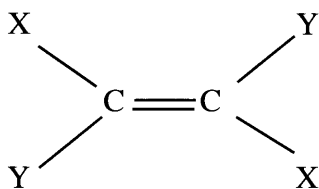
42 (b) The characteristic of solid substances to exhibit more than one crystalline or amorphous form is defined as polymorphism.

43 (a) The arrangement of geometric isomers in which two ions (in our case Cl) can either be along the same edge of the square (cis) or on opposite corners (trans).

Generally trans-isomers are more stable compared to cis-isomers.



[CIS ISOMER]



[TRANS ISOMER]

44 (b) Cozaar (Losartan) is classified as angiotensin II receptor antagonist. It blocks the binding of angiotensin II to AT receptors. It is indicated for the treatment of hypertension. The recommended dose of the drug is 50 mg per day with or without food. Hyperkalemia, diarrhea, hypotension, tachycardia and angioedema are reported side effects of the drug.

45 (d) According to Fick's law of diffusion, the rate of diffusion is directly proportional to the area of the solid, the concentration difference between the concentration of solute in the stagnant layer at the surface of solid and its concentration on the farthest side of the stagnant layer and diffusion coefficient. It is inversely proportional to the length of stagnant layer.

The driving force behind the movement of the solute molecules through the stagnant layer is the difference in concentration of solute at C₁ and its concentration at C₂.

$$\text{Rate of solution} = \frac{D \times A \times (C_1 - C_2)}{L}$$

D = Diffusion coefficient

A = Surface area of solid

C₁ = Concentration near to stagnant layer

C₂ = Concentration of solute to other side of stagnant layer.

L = The length of the stagnant layer

46 (c) Acetone is classified as a semipolar solvent. Water is classified as a polar and benzene is classified as a non-polar solvent.

47 (b) The process of degradation of ionic salt into cations and anions in the presence of water is known as hydration. If the solvent is other than water, the process is known as solvation.

48 (a) As the molecular weight of alcohol increases, the solubility of alcohol decreases. As the molecular weight of alcohol increases, the chances of formation of hydrogen bonds between

water and OH groups of alcohol decreases, therefore high molecular weight alcohols are poorly soluble in water.

49 (c) The degradation of Riboflavin by light is an example of photochemical degradation. Light generally catalyzes oxidation and reduction of photoexcited species of such drugs. Riboflavin and phenothiazine are examples of such drugs.

50 (a) The degradation of Penicillin G Procaine is the highest in a solution, since the hydrolysis of Penicillin G procaine is catalyzed by hydrogen or hydroxide ions.

51 (d) The rate of oxidation is influenced by temperature, radiation and the presence of a catalyst. It is not affected by hydrolysis. Ephedrine, ascorbic acid, phenothiazine and vitamin A are examples of pharmaceutical products that oxidize very easily.

52 (d) A large number of pharmaceutical products such as liquid dispersion of methyl cellulose, carboxymethylcellulose, tragacanth and sodium alginate follows pseudoplastic flow. The viscosity of the pseudoplastic flow decreases with an increase in rate of shear. It does not have the yield value.

Normally, as shearing stress increases, the disarranged particles of the solute try to get along with the direction of flow. At certain levels with each successive shearing stress, the greater rate of shear can be achieved with minimum stress. In addition, some of the solute molecules (entrapped between solvent molecules) may be released, which reduces apparent viscosity of the flow. Pseudoplastic flow is known as a "shear thinning system".

Generally, non-newtonian flow can be classified in three classes of flow: plastic, pseudoplastic, and dilatant.

The material that exhibits the plastic flow is known as the Bingham body. Plastic flow has a yield value, which means that it does not start to flow until shear stress exceeds the yield value, and therefore plastic flow curve does not pass through the origin but rather intersects the shearing stress axis.

Concentrated suspension with flocculated particles generally follows the plastic flow. Plastic flow has a yield value because of the presence of van der Waals force between flocculated particles, and the need to break such force before it exists in the flow.

The third type of flow is described as Dilatant flow. It is also known as a "shear thickening system" in which the viscosity of the system increases with increase in shear stress. It is generally observed more with suspension that contains a high percentage of dispersed solid (about 50% or greater of small deflocculated particles).

The system that follows conversion from gel to sol upon applying shear stress and reforms back to gel from sol upon resting is defined as Thixotropy. The application of thixotropy is very useful in the formulation of pharmaceutical products. For example, the well formulated thixotropy suspension will not settle out readily and will become fluid upon shaking.

53 (b) Microemulsion is the liquid dispersion of water and oil that is made homogeneous and transparent by the addition of surfactant and cosurfactant. It is not a thermodynamically stable. The droplet size of microemulsions lie between 10 to 200 nm. They are intermediate in property between solution and emulsion.

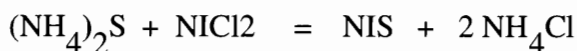
54 (a) A system with considerable interaction between the disperse phase and dispersion medium is known as Lyophilic dispersion or solvent loving dispersion. If the dispersion medium is water, the system is known as hydrophilic.

Hydrophilic suspension is subdivided in to three categories:

- I True solution, i.e. acacia and povidone solution.
- II Gells or jellies, i.e. gels of methylcellulose, gelatin and starch
- III Particulate dispersions, i.e. suspension of bentonite

Lipophilic or Oleophilic dispersions have a high affinity for oily substances such as benzene, vegetable oils, essential oils, and mineral oil etc.

55 (b) 2.



56 (b) The random motion of solute particles in colloidal dispersion is known as Brownian motion.

57 (b) Flocculated suspensions have the following characteristics:

* The rate of sedimentation is high. A sediment generally forms rapidly compared to deflocculated particles. The sediment is loosely packed and can be easily redispersed with minimum stress. Particles in sediment do not bind tightly to each other. The suspension with flocculated particles has a clear supernatant region.

In contrast, the rate of sedimentation of deflocculated suspension is slow, but once the particles settle at the bottom of the container it is very difficult to redisperse them. Sediment forms slowly and particles in sediment are tightly packed. The supernatant remains the cloudy.

In pharmacy practice suspension with flocculated particles is the most acceptable.

58 (d) The relation of the rate of sedimentation with various parameters can be expressed by Stoke's law.

$$V = \frac{2r^2(P_1 - P_2)g}{9\eta}$$

V = velocity of sedimentation in cm/sec

r = radius of the particles in cm

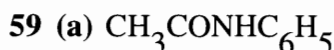
P₁ = density of disperse phase in g/cm³

P₂ = density of dispersion medium in g/cm³

η = viscosity of dispersion medium

g = gravity acceleration 980.7 cm/sec²

The rate of sedimentation is independent of the lipophilic nature of particles.



60 (c) The spontaneous isomerization of two isomers in an aqueous solution causes specific rotation which is known as mutarotation.

61 (b) Dextran is an example of a polysaccharide. Other polysaccharides include:

- * Dextrin
- * Inulin
- * Starch
- * Cotton
- * Soy polysaccharides

62 (c) Lipids can be divided into five classes according to their chemical structure.

Glycolipids: Also known as Cerebro-sides. They are isolated from the brain. Upon hydrolysis, they yield fatty acid, galactose and sphingosine. They are also known as galactolipids due to the presence of galactose, such as phrenosin, kersin.

Phospholipids : Known as Phosphatides. They are esters consist of fatty acid, phosphoric acids and nitrogenous compounds, such as lecithin.

Sterols : The sterols are alcohols structurally related to steroids. They are obtained from plants and animals such as cholesterol and ergosterol.

Waxes : Waxes are defined as high molecular weight esters. They consist of monohydric alcohol and high molecular weight fatty acids, such as spermaceti.

Fixed oils and fats : They are esters of glycerol and fatty acids, such as olive oil. Fixed oils such as lard, which are solid at room temperature are known as fat.

63 (d) Sphingosine is not a hydrolysed product of lecithin. Lecithins are phospholipids and are generally hydrolysed to fatty acid, phosphoric acid and nitrogenous compounds other than sphingosine.

64 (b) Imidazole is an active moiety of the listed compound.

65 (a) Albumin is an example of simple protein.

Protein is generally classified in three different categories:

- I Simple protein
- II Conjugated protein
- III Derived protein

Simple protein : Naturally occurring proteins, which upon hydrolysis yield only alpha-amino acids such as albumins, globulins, prolamines, glutelins and albuminoids.

Conjugated protein: Conjugated proteins are further classified on the nature of prosthetic groups.

<u>Prosthetic gp</u>	<u>Example</u>
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Phosphoprotein	Phosphoric acid	casein, ovovitellin
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Nucleoprotein	Nucleic acid	nuclein
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Glycoprotein	Carbohydrate	mucins
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Chromoprotein	Colored gp	hemoglobin
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Lipoprotein	Lipids	lecithin
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Metalloprotein	Metals	tyrosinase, arginase, xanthine oxidase
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Derived proteins: They are formed from primary or conjugated proteins by the actions of the acid, alkali, heat, water, enzyme or alcohol. They generally differ in physical and chemical properties from the protein they are derived from. They subdivide into primary derived protein (Denatured protein) or secondary derived protein.

66 (b) 5- Fluorouracil . It is classified as a cytotoxic substance. It is a pyrimidine antagonist. It is indicated for the treatment of the rectum, stomach, colon, pancreas and breast cancers. Esophagopharyngitis, myocardial ischemia, angina, photophobia and decreased vision are reported side effects of the drug.

67 (a) L.leichmanni is the most widely used test organism for microbial assay of vitamin B 12. L.plantarum is generally used for microbial assay of Niacin and Calcium pantothenate.

68 (b) Gravimetric analysis is not considered a titrimetric method of analysis. Titrimetric methods of analysis generally include :

- I Acid base titrations
- II Precipitation reactions

- III Redox reactions
- IV Complexation reactions
- V Large anion and large cation reactions

Gravimetric methods of analysis include:

- I Weighing drugs after separation
- II Weighing a derivative after separation
- III Weighing a residue after ignition

Spectrometric methods of analysis include:

- I Colorimetry
- II UV absorption
- III IR absorption
- IV Fluorimetric emission
- V NMR absorption
- VI Atomic absorption

Electrochemical methods of analysis include :

- I Voltammetry
- II Potentiometry

Chromatographic methods of analysis include :

- I Gas chromatography
- II HPLC
- III TLC

*

69 (b) Sick cell anemia and Beta-thalassemia are hemolytic anemias associated with abnormal hemoglobins. Due to poor solubility of such abnormal hemoglobins in a reduced state, semicrystalline bodies are formed inside of RBC. These crystalline bodies are pointed and elongated inside of the cell, and rupture the red blood cells.

The detection of sickle-cell disease can be done by viewing red cell sickling in the presence of the reducing agent sodium metabisulfite, or by quantitative determination of turbidity produced by dithionite following the reduction of HbS to deoxyHbS in RBC.

G6PD-Hemolytic anemia:

The enzyme glucose-6-phosphate dehydrogenase is necessary to maintain the reduce glutathione level (GSH) in red blood cells. This enzyme is necessary to prevent the hemolysis. The deficiency of this enzyme may cause severe hemolytic anemia in patients with the use of certain oxidant drugs such as primaquine, sulfonamide, nitrofurantoin, nalidixic acid, probenecid, chloroquine and dimercaptol.

Glutathione is an antioxidant which prevents the oxidation of hemoglobin to methemoglobin. NADPH is required to keep glutathione in a reduced state and G6PD is needed to convert NADP to NADPH. When RBC's are deficient in G6PD, the amount of NADPH is not adequate to keep glutathione in a reduced state, so free radicals accumulate inside of red blood cells and cause the oxidation of hemoglobin to methemoglobin.

70 (d) Except Penicillin, all of the mentioned medications may cause hemolytic anemia in patients with G6PD deficiency.

71 (a) Rho gam is a useful drug for treatment of an Rh negative mothers with an Rh positive infant. In Rh negative mother, Rh positive antigens may transfer from Rh positive fetuses to the mother via placenta. This may lead to production of Rh positive antibodies in the mother's blood. These same antibodies may transfer back from the mother's blood into fetus via the placenta, and produce antigen-antibody reactions. This leads to lysis of red blood cells in the fetus, and miscarriage. Rho gam prevents the formation of anti-Rh antibodies in an mother who bears a Rh positive fetus.

72 (c) PKU is a disease characterized by an elevated serum concentration of phenylalanine and the presence of phenylpyruvic acid in urine. The deficiency of enzyme phenylalanine hydroxylase

is responsible for this. Phenylalanine hydroxylase converts the phenylalanine to tyrosine. The disease is associated with mental deficiency.

The Guthrie test is performed to detect PKU. The agar medium with serum or blood on the surface is impregnated with alanine at a concentration sufficient to inhibit the growth of *B. subtilis*. Phenylalanine reverses this inhibition and bacterial inhibition assay is a direct measure of phenylalanine.

73 (b) The metabolic product of epinephrine and nor epinephrine is vanillylmandelic acid. Homovanillic acid is a metabolic product of dopamine and 5 hydroxyindoleacetic acid is of serotonin.

74 (b) *Clostridium tetani* is an anaerobic organism that causes tetanus. Below are important organisms and the disease produced by those organisms.

Gram Positive Microorganisms

<i>Organisms</i>	<i>Disease</i>
<i>Propionibacterium acne</i>	Acne
<i>Bacillus anthracis</i>	Anthrax
<i>Streptococcus pneumonia</i>	Meningitis Pneumonia
<i>Streptococcus mutane</i>	Dental caries
<i>Streptococcus pyrogens</i>	Food poison Pharyngitis Rheumatic fever
<i>Staphylococcus aureus</i>	Food poison Skin infection Wound infection Toxic shock-syndrome

Enterococcus faecalis Endocarditis

Gram Negative Organisms

<i>Organisms</i>	<i>Disease</i>
<i>Hemophilus influenza</i>	Meningitis
<i>Neisseria meningitis</i>	Meningitis
<i>Gardenerella vaginitis</i>	Bacterial vaginitis
<i>Vibrio cholera</i>	Cholera
<i>Hemophilus aegyptius</i>	Conjunctivitis
<i>Campylobacteria sp</i>	Food poisoning
<i>Shigella</i>	Food poisoning Shigellosis
<i>Salmonella</i>	Food poisoning Salmonellosis
<i>Neisseria gonorrhea</i>	Gonorrhea
<i>Legionella pneumophilia</i>	Legionnaire's disease
<i>Borrelia burgdorferi</i>	Lyme disease
<i>Helicobacter pyroli</i>	Peptic ulcer
<i>Yersinia pestis</i>	Plague
<i>Klebsiella pneumonia</i>	Pneumonia
<i>Salmonella typhi</i>	Typhoid
<i>Treponema pallidum</i>	Syphilis
<i>Chlamydia trachosis</i>	Trachoma

Bordetella pertussis	Whooping cough
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Rabies	Rabies
Poliovirus	Poliomyelitis

Anaerobic Microorganisms

<i>Organisms</i>	<i>Disease</i>
Clostridium botulinum	Botulism
Corynebacterium diphtheria	Diphtheria
Clostridium perfringens	Gas gangrene
Clostridium difficile	P.colitis
Clostridium tetani	Tetanus

Rubella	Rubella
Varicella zoster	Shingles
Variola virus	Smallpox
Yellow fever	Yellow fever

75 (b) E.coli is responsible for causing most of urinary tract infections (UTI).

76 (b) A sweat test helps to confirm cystic fibrosis. The sweat of patients with cystic fibrosis usually contains 3 to 5 times higher concentrations of chloride ions than patients without the disease.

Miscellaneous

<i>Organisms</i>	<i>Disease</i>
Mycobacterium lepre	Leprosy
Mycobacterium tuberculosis	Tuberculosis

77 (b) Urticaria or hives is a skin reaction characterized by wheal formation. The lesions are well-circumscribed discrete wheals with erythematous raised serpiginous borders and blanched centers. The lesion is associated with intense pruritus or burning. Urticaria or formation of wheals is not a life-threatening condition itself, but it may indicate the patient is more susceptible to anaphylactic reactions.

Important viral diseases

<i>Organisms</i>	<i>Disease</i>
Varicella-zoster	Chickenpox
Epstein Barr	Burkitt, Lymphoma, Infectious Mononucleosis
Cytomegalovirus	Cytomegalic inclusion disease
Herpes simplex	Herpes
HIV	Aids
Paramyxovirus	Mumps

Eczema: It is also known as Atopic dermatitis and is characterized by itching. The appearance and distribution of lesions depend on the age of the patient. It can be further subdivided into infant-type atopic dermatitis, childhood-type atopic dermatitis and adult-type atopic dermatitis.

Allergic contact dermatitis: It is a common skin disease caused by direct contact with substances such as acid and alkali, or by excessive use of soap.

Exfoliative Dermatitis: It is also known as erythroderma syndrome. It is a fatal complication that occurs due to other poorly controlled dermatitis reactions.

Erythema multiform: It is a skin reaction result of systematic allergic reaction to various agents such as Stevens-Johnson syndrome.

Impetigo: It is a superficial bacterial infection of the skin. The causative organisms are coagulase -positive staphylococci and beta hemolytic streptococci. It is more common in children.

78 (c) Diabetes insipidus is a disorder that usually occurs due to a decrease in production of Antidiuretic Hormone (ADH). It is characterized by a severe increase in thirst, polyuria and polydipsia. The urine volume increase is up to 16 to 24 liters per day. Patients should be watched for dehydration.

79 (b) The rate of reaction is independent of concentration in zero order kinetic.

Zero order reaction: The rate of change in the concentration of reactants and products depends on factors other than concentration of reactants, e.g. photochemical reactions.

$$r = -\frac{dc}{dt} = k, t_{1/2} = \frac{a}{2k}$$

First order reaction: The rate of change in the concentration of reactants is proportional to the first power of the concentration of a single reactant.

$$r = -\frac{dx}{dt} = k(a - x)$$

$$\frac{dx}{dt} = k(a - x)$$

$$k = \frac{2.303}{t} \log \frac{a}{(a - x)}$$

$$t_{1/2} = \frac{0.693}{k}$$

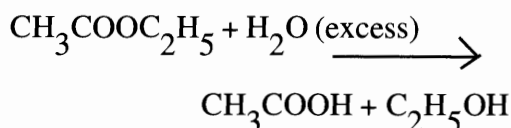
Second order reaction: The rate of change in the concentration of reactants and products is proportional to either the second power of concentration of one reactant or a single power of concentration of two reactants.

$$-\frac{dx}{dt} = k(a - x)(b - x)$$

$$kt = \frac{x}{a(a - x)}$$

$$t_{1/2} = 1/ka$$

Pseudo First order reactions: In second order reaction, if one of the reactant present in a very large amount then, rate of such reaction usually depends on the concentration of large reactant and independent of the concentration of the second reactant, this type of reaction is usually described as a pseudo first order reaction, such as hydrolysis of ethyl acetate in the presence of an excess amount of water.



80 (b) The initial degradation of drugs by the liver after oral administration the of the drug is defined as First Pass Effect of metabolism.

81 (d) The concentration of a drugs at the receptor site does not affect the protein binding of the drug. The factors that affect the protein binding of drugs are :

- * Type of proteins available for binding.
- * The protein binding affinity and capacity of the drug.
- * The presence of competing substances for protein binding.
- * The disease condition that may alter the amount of protein available for binding.

The lists of the conditions or diseases that may decrease albumin levels in plasma and thereby decrease the protein binding includes :

- * Burns
- * Pregnancy
- * Cystic fibrosis
- * Chronic liver disease
- * Chronic renal failure
- * Trauma

The conditions that may increase albumin levels in plasma and thereby increase the protein binding includes:

- * Hypothyroidism

82 (d) In hypothyroidism, the plasma albumin level is found to be elevated.

83 (b) Tagamet (Cimetidine) is an H_2 receptor antagonist indicated for treatment of GERD and heartburn. It has a powerful $cp450$ inhibition property. The recommended dose of the drug is 400 mg b.i.d. Diarrhea, pancreatitis, and headache are reported side effects of the drug.

84 (a) Lactulose is indicated for treatment of hyperammonia. It is degraded into organic acid which decrease the pH of the colonic contents. The acidic contents of the colon entraps the ammonia as ammonium ions and reduces the concentration in the blood.

85 (b) A patient with hemophilia has a deficiency of coagulation factor VIII, known as Antihemophilic factor (AHF). The deficiency of this enzyme will result in severe coagulation defect. It is indicated for treatment of hemorrhage in patients with Hemophilia A or to prevent bleeding in various surgical procedures.

86 (a) Sodium polystyrene sulfonate reduces the elevated serum concentration of potassium (hyperkalemia). It is an ion exchange resin that replaces the potassium ions for sodium ions. The recommended dose of the drug is 15 grams, one to four times a day. Constipation, anorexia, and gastric irritation are reported side effects of the drug.

87 (b) Polycythemia and erythrocytosis are conditions in which there is an increase in the number of erythrocytes found. In contrast, leukemia is a condition in which there is an increase in the number of leukocytes. Thrombopenia is associated with a decrease in thrombocytes counts.

88 (d) Doxazosin, Terazosin and Prazosin are specific α -1 blockers. They are indicated for treatment of hypertension and BPH. The major side effects of these agents are first dose syncope and tachycardia.

89 (c) The stimulation of α -2 receptors prevents the release of noradrenaline i.e. clonidine and methyldopa.

The function of other receptors:

Alpha-1 receptors: Stimulation of these receptors may result in the constriction of blood vessels that supply to skeletal muscles, therefore α -1 blockers are very good vasodilators. These include Prazosin and Terazosin, Doxazosin.

Beta-1 receptors: Stimulation of these receptors may increase the cardiac rate. Agents

of this class are helpful in the treatment of cardiogenic shock. Inhibition of these receptors helps in controlling hypertension, therefore beta blockers are indicated for treatment of hypertension i.e. propranolol and atenolol

Beta-2 receptors : Stimulation of these receptors dilate vascular smooth muscles, therefore most of the bronchodilators are good Beta-2 stimulators. These include albuterol, and salmeterol.

90 (b) Hypertrichosis (increase in hair growth) is a side effect associated with the use of Loniten (Minoxidil). This adverse effect of Minoxidil has been used for treatment of male pattern baldness. Minoxidil is classified as an antihypertensive agent. It is indicated for the treatment of hypertension and male pattern baldness. The recommended dose of the drug is 5 mg per day. Hypotension, tachycardia, edema, nausea and vomiting are reported side effects of the drug.

91 (c) The most preferable route for the administration of Sodium nitroprusside is intravenous because of the short half life of the drug.

92 (b) Overdose of sodium nitroprusside generally results in hypertension instead of hypotension. The overdose of this agent results in cyanide poisoning, which in turn stimulates the carotid chemoreceptors, responsible for causing hypertension and tachycardia.

93 (c) The use of Sodium nitroprusside should be strictly restricted in infants due to a lack of enzyme rhodanase that converts the cyanide into sodium thiocyanate.

94 (b) Primacor (Milrinone) is known as an inodilator since it has inotropic as well as vasodilation properties. It is a selective inhibitor of cAMP phosphodiesterase enzymes in cardiac and vascular muscles. It is indicated for the treatment of CHF. The recommended dose of the drug is 50

mcg/kg administered slowly via I.V. infusion, over ten minutes. Arrhythmia, tachycardia, hypotension, and thrombocytopenia are reported side effects of the drug.

95 (b) Procainamide is a class IA arrhythmic agent. Here is the classification of antiarrhythmic agents:

Class IA : Procainamide, quinidine, disopyramide

Class IB : Phenytoin, lidocaine, mexiletin, tocainide

Class IC : Propafenone, Flecainide, Moricizine

Class II : All the beta blockers

Class III : Sotalol, Bretylium, Amiodarone

Class IV : All the calcium channel blockers.

96 (b) Mevacor (Lovastatin) is a lipid lowering drug that acts by inhibition of the HMG COA reductase enzymes. This enzyme is responsible for the conversion of 3-hydroxy 3 mehtylglutaryl-coenzymeA to mevalonate, the precursor for sterols including cholesterol. The inhibition of biosynthesis of cholesterol reduces the cholesterol in hepatic cells, which stimulates the synthesis of LDL receptors. These will all reduce the synthesis of cholesterol. It is indicated for the treatment of hypercholesterolemia. Abdominal cramps, pain, diarrhea, constipation, dyspepsia, myalgia, and arthralgia are reported side effects of the drug. The recommended dose of the drug is 20 mg once daily with an evening meal. The other agents in the same class are:

- * Fluvastatin
- * Atrovastatin
- * Pravastatin
- * Cerivastatin

97 (a) Doxapram is indicated as the respiratory stimulant agent in postanesthesia and in chronic obstructive pulmonary disease associated with acute hypercapnia. The respiratory stimulant to effect of this agent is attributed to its ability to stimulate the respiratory center in the medulla via carotid chemoreceptors.

Ipecac is widely used as an emetic in accidental poisoning. It is also used as an expectorant.

Dopamine is formed by the decarboxylation of 3,4-dihydroxyphenylalanine (DOPA). It is a precursor to noradrenalin and is also itself a neurotransmitter in CNS. It is indicated for treatment of cardiac shock. The vasodilation offered by dopamine is very important in drawing the blood in the kidney and small bowel during an ischemic attack. The diuretic property of dopamine helps to preserve the renal tubules. The cardiac stimulation improves the deteriorated cardiac function. Hypotension is a principal adverse effect of the drug.

Disopyramide is classified as a class IA antiarrhythmic agent. It has profound anticholinergic side effects with severe A.V. node suppression properties. It should be carefully used in patients with congestive heart failure with glaucoma and urinary hesitancy. The major adverse effects reported are dry mouth, constipation, urinary retention and blurred vision.

98 (b) Acetylcysteine is classified as an expectorant, an agent that loosens and liquefies the mucous, soothes irritated mucosa and makes coughs more productive. It generally decreases the viscosity of bronchial secretions and facilitates the excretion of cough. It is also indicated as an antidote to minimize hepatic toxicity in acute acetaminophen overdose. Other expectorants include: guaifenesin, ipecac, potassium iodide and sodium iodide, terpin hydrate.

Dextromethorphan and benzonatate are classified as antitussive agents, the substances that specifically inhibit or suppress the act of coughing. Benzonatate acts peripherally by anesthetiz-

ing stretch receptors in the respiratory passage and reducing the cough reflexes. Dextromethorphan and codeine act centrally by depressing the cough center in the medulla.

Terbutaline is indicated as a bronchodilator for asthma patients and as a uterine relaxant in premature labor.

99 (b) Terbutaline is indicated as uterine relaxant for women in labor.

100 (b) Ipratropium is an atropine-like drug. It is indicated for the treatment of asthma and chronic obstructive pulmonary disease. Dryness of mouth, irritation in the throat, blurred vision and mild bradycardia have been reported with the drug.

Retrovir is indicated for treatment of HIV. Anemia and neutropenia have been reported. Retrovir induced anemia can be treated by the use of Epogen.

Carvedilol is a new beta blocker just recently introduced in the market. It is indicated for treatment of CHF.

Latanoprost is a prostaglandin analog indicated for treatment of glaucoma. It should be refrigerated.

101 (b) Cyclobenzaprine is indicated for treatment of muscle spasm associated with acute, painful musculoskeletal conditions. It is ineffective in treating muscle spasm due to a central nervous system disease.

Dantrolene sodium is indicated in controlling treatment of spasticity resulting from upper motor neuron disorders such as spinal cord injury, stroke, cerebral palsy or multiple sclerosis. It is not indicated for skeletal spasm resulting from rheumatic disorders. The major adverse effect reported with Dantrolene is hepatotoxicity.

Bromocriptine is indicated for treatment of Parkinsons. It is a dopamine receptor agonist. The principal adverse effect associated with the use of Bromocriptine is lung toxicity.

Amphetamine is indicated for treatment of Attention Deficit Hyperactivity Disorder. It is a controlled II drug. Central system stimulation and insomnia have been reported with use of Amphetamine.

102 (c) Parlodel (Bromocriptine) is classified as an antiparkinsons drug. It is indicated for the treatment of Parkinsonism. It is a dopamine receptor agonist. The recommended dose of the drug is 2.5 mg to 5 mg twice daily with meals. Pulmonary dysfunction is the principal side effect of the drug.

103 (b) Diamox (Acetazolamide) acts through the inhibition of carbonic anhydrase enzymes. It is indicated for treatment of glaucoma, epilepsy and edema. The recommended dose of the drug is 250 mg to 1000 mg per day. Nausea, vomiting, seizure, bone marrow depression, electrolytes loss, hemolytic anemia, and toxic epidermal necrosis are reported side effects of the drug.

104 (b) Zaroxolyn (Metolazone) is classified as a thiazide diuretic. It increases the excretion of Na, Cl, and H₂O. It is indicated for the treatment of edema associated with CHF, renal disease and nephrotic syndrome. The recommended dose of the drug is 5 to 20 mg once daily. Electrolyte loss is a common complication of Metolazone therapy.

105 (d) ACE inhibitors therapy associated with an increase in serum concentrations of potassium. Amiloride, Spironolactone and Triamterene are potassium sparing diuretics and may cause hyperkalemia if used simultaneously with ACE inhibitors.

106 (d) All. Probenecid may competitively inhibit the renal tubular secretion of penicillin, sulfonylurea, sulfonamide, naproxen, indomethacin, clofibrate, aminosalicyclic acid and pantothenic acid.

107 (b) The I.V. dextrose and glucagon can be administered for the treatment of insulin

overdose. Glucagon and dextrose cause an increase in blood glucose concentration and helps in relieving hypoglycemia and insulin overdose toxication.

108 (b) Diabinese (Chlorpropamide) is classified as a sulfonylurea agent. It is indicated for the treatment of diabetes and as a secondary therapy to treat partial central diabetes insipidus. It has been successfully used as an antidiuretic to reduce polyuria in patients with this disorder. Hypoglycemia, severe diarrhea, and water retention are reported side effects of the drug. The recommended dose of the drug is 200 mg to 500 mg per day for treatment of diabetes insipidus. Desmopressin is considered as primary therapy for treatment of diabetes insipidus.

109 (b) A deficiency of vitaminA generally causes night blindness. Below are vitamins and their deficiency induced diseases.

<u>Vitamin</u>	<u>Sources</u>	<u>Diseases</u>
Vit A	carrots, milk fish, liver, oil, eggs	night blindness
Vit B1 (Thiamin)	germinated cereals	beriberi
Vit B2 (Riboflavin)	milk, yeast, eggs, meat, green veg.	cheilitis
Vit B12 (Cyanocobalamin)	milk, liver	pernicious anemia
Nicotinic acid (Niacin)	leafy veg., wheat, nuts, pulses	pellagra
Folic acid	green veg., curd, liver	macrocytic anemia

Vit C (Ascorbic)	citrus fruits lemon, amla tomato, green veg.	scurvy
Vit B6 (Pyridoxine)	liver, meat, green veg	peripheral neuropathy
Vit D (Calciferol)	butter, eggs, cod liver oil, shark liver oil	rickettsia osteoporosis
Vit E (Tocopherol)	leafy veg., milk	
Vit K	veg, tomato, soybean	bleeding disorder

110 (b) Methotrexate overdose can be treated by administering Wellcovorin (Leucovorin Ca). It is a derivative of tetrahydrofolic acid. It is indicated to reduce the toxicity associated with overdose of folic acid antagonists, such as Methotrexate, Pyrimethamine, and Trimethoprim. Allergic reactions such as urticaria and anaphylaxis are reported side effects of the Leucovorin. It should be carefully used with 5 FU since the former enhances the toxicity of the later.

111 (b) Alprazolam, Lorazepam, Temazepam, Zolpidem, Zaleplon and Triazolam are short acting benzodiazepines and are more preferable to use for older or geriatric patients because of their short half lives.

112 (b) Mysoline (Primidone) is a prodrug metabolites to phenobarbital and phenyl ethyl malonamide. Its sedative, hypnotic and anticonvulsion effects are attributed to its ability to increase the concentration of GABA in the brain. It is indicated for the treatment of tonic-clonic seizure. Ataxia, vertigo, drowsiness, diplopia, nystagmus, nausea and vomiting are reported side effects of the drug. The recommended dose of the drug is 100 to 125 mg at bed time.

113 (a) Prozac (Fluoxetine) is classified as an SSRI. It has a prolonged half life. It takes 3 to 5 weeks to get the drug completely out of the body. It should be carefully prescribed with MAO inhibitors. Insomnia is the principal side effect of the drug. The recommended dose of the drug is 20 to 40 mg per day. The concurrent use of these two medications will result in severe hypertensive crisis. Tranylcypromine is an MAO-A inhibitor and should be avoided by patients taking Fluoxetine.

114 (d) Antiseptic controls the growth of microorganisms and should not be classified as an insect control chemical. Insect control chemicals may be classified in to four different categories: insecticides, fumigants, repellents, and attractants.

Insecticides: They are further classified according to the type of action that results in the destruction of insects.

- I Stomach poison
- II Contact insecticide
- III Fumigant

Stomach poison : In this method, the insecticides are mixed with food that is consumed by insects, such as in the control of leaf feeding insects.

Contact insecticides : This is the most common use for control of insecticides. In this method, insecticides should be placed where the contact of insects with the insecticide can be easily achieved.

Fumigants : They are gases or vapors of insecticides for the control of insects, usually in closed spaces.

Repellants : Certain insecticide chemicals possess the repellent action. This will cause insects to avoid such places treated with such insecticides.

Attractants: In this method, the insects are attracted by various means such as food particles such as sugar, milk and molasses to feed on them.

115 (b) It is a suspension form of Barium sulfate medically used in roentgenography for the examination of the stomach and colon. The principal adverse effect of Barium sulfate is constipation. It should be mixed well with food or strained through gauze before administered to the patient.

The solution form of Barium ion is highly toxic, therefore it is recommended to indicate the full name of the drug when prescribing. For example "Barium sulfate" instead of "Barium."

116 (b) Ascorbyl palmitate is classified as an antioxidant agent that prevents or inhibits the oxidations in various pharmaceutical formulations and therefore prevents the deterioration of various formulations. These include butylated hydroxyanisole, ethylenediamine, potassium metabisulfite, sodium bisulfite and sodium metabisulfite.

A preservative is a substance that inhibits the growth of microorganisms and prevents the various formulations to get deteriorated from various microbes such chlorobutanol, dehydroacetic acid, potassium benzoate and potassium sorbate.

Coloring agents may be defined as substances used for the purpose of imparting color, such as red ferric oxide, carbon black, titanium dioxide and alizarin.

Flavoring agents may be defined as compounds used for the purpose of imparting flavors. There are four basics or primary tastes-sweet, bitter, sour and saline. Mannitol, lemon oil, orange oil, peppermint oil, sucrose, vanilla and wild cherry syrup are used for flavoring purposes.

117 (b) Epinephrine hydrochloride solution can be stabilized by the addition of a small amount of sodium bisulfite, which is an antioxidant.

118 (d) All mentioned choices (FD and C, D and C, external D and C dyes) are classified as certified colors.

119 (c) Spicy is not classified as a primary taste. Sweet, sour, bitter and saline are primary tastes.

120. (b) The initial plasma concentration of the drug is 10 mcg/ml, therefore:

<u>Mcg/ml</u>	<u>Hours</u>
10 mcg/ml	0
5 mcg/ml	8 hours
2.5 mcg/ml	8 hours
Total = 16 hours	

The half-life of the drug should be 8 hours.

121 (b) The sweet taste of a compound is attributed to the presence of polyhydroxy groups. The sweetness of a compound increases with an increase in the number of hydroxy groups such as amino and amide groups that contain compounds.

The sour taste of a compound is attributed to the presence of hydrogen ions and lipid solubility of compounds such as acid, tannins, phenol, lactones and alum.

The presence of cations and anions in the same compound imparts the saltiness to the compound, i.e. KBr, NH Cl and NaCl.

Free bases such as alkaloid and amides (molecular weight greater than 300) may impart a bitter taste to the compound, i.e. amphetamines.

122 (a) The alcohol content of low alcoholic elixir is 8 to 10%, and for high alcoholic elixir it is 73 to 78%.

123 (a) Erythema multiform (EM) is classified as a dermatological reaction. It is characterized by the presence of erythematous macules and papules peripherally, i.e. hands, feet, trunk, legs and forearms.

Toxic epidermal necrolysis (TEN) is generally caused by drugs and group II staphylococci. It is also known as Lyell's syndrome. It is characterized by the presence of erythema all over the

body. Drugs that may cause this are: penicillin, phenylbutazone, allopurinol, chloramphenicol and sulfonamide.

Steven-johnson syndrome is a severe variant form of erythema multiform (EM). It is characterized by the presence of erythematous macules and papules peripherally, as well as on the mucous membrane. The skin becomes hemorrhagic. The drugs that may cause this are sulfonamide, penicillin, phenytoin, allopurinol, phenobarbital and chlorpropamide.

Hirsutism or hypertrichosis is defined as the presence of hair all over the body. It is a principle adverse effect of Minoxidil. It is now used for the treatment of baldness.

124 (b) N-acetylcysteine is found to be an effective antidote for the treatment of acetaminophen overdose. The toxic metabolic product of acetaminophen damages the liver by binding to the cells of the liver. The normal dose of acetaminophen does not cause this since only a small amount of metabolites form, which may be easily conjugated with glutathione in the liver.

125 (b) Chlorpromazine, erythromycin estolate, chlorpropamide, trazodone, certain tricyclic antidepressants, sulindac and methyldopa may produce cholestatic jaundice. The disease is usually characterized by the presence of fever, chills, nausea, vomiting, anorexia and myalgias.

126 (c) The principal adverse effect of Clindamycin is AAC (antibiotic associated colitis). It is classified in the macrolide group of antibiotics. Severe diarrhea is a reported side effect of the drug.

127 (b) Aplastic anemia is a major adverse effect of Chloramphenicol. The bone marrow toxicity of chloramphenicol is further classified as dose related or not dose related. The dose related effects of chloramphenicol can be reversed by withdrawing the drug. The second type, dose not related, is fatal and life-threatening. It does not

depend on the duration or dose of therapy and cannot be prevented by withdrawing the drug.

128 (d) Drugs that may cause hemolysis in a patient with G6PD deficiency include: quinine, sulfonamide, nitrofurantoin, primaquine, aspirin, phenacetin, quinidine and isosorbide dinitrate.

Immune hemolytic anemia is most commonly found with methyldopa. Anemia usually begins 18 weeks to 4 years after treatment. Mefenamic acid, levodopa and streptomycin are also reported to cause immune hemolytic anemia. Hemolytic anemia is induced by drugs, and returns to normal rapidly with discontinuation of therapy.

Erythromycin does not produce hemolytic anemia in patients with G6PD deficiency.

129 (b) Ringing or buzzing (tinnitus) in the ear is associated with salicylate. It is dose related and generally appears at a serum concentration of 20 mg/dl or higher. Salicylate induced hearing loss may return to normal within 3 days after discontinuation of the drug.

Permanent hearing loss is reported with aminoglycoside antibiotics. Neomycin is the most oto and nephro toxic among the aminoglycosides.

Minocycline, a derivative of tetracycline is also an ototoxic drug and its use requires great caution in older patients.

Loop diuretics such as furosemide, bumetanide and ethacrynic acid also possess the ability to produce ototoxicity.

130 (b) Mellaril (Thioridazine) is classified as an antipsychotic drug. It is indicated for the treatment of schizophrenia. Pigmented retinopathy is the most common side effect of the drug. The severity of this side effect is dose and therapy

related. A dose of more than 800 mg is strictly prohibited by the FDA. NMS, tardive dyskinesia, and extrapyramidal symptoms are reported side effects of the drug.

Drugs that may cause ocular toxicity include:

- * Chloroquine
- * Hydroxychloroquine
- * Amiodarone
- * Chlorpromazine
- * Phenothiazine class of drugs
- * Corticosteroid, by increasing intraocular pressure of eyes

131 (d) All. Bleomycin, Amiodarone and Nitrofurantoin are associated with pulmonary toxicity.

132 (a) Extensive clinical trials on humans generally include phase III clinical trials.

Clinical studies of new drugs on humans are generally subdivided into four phases:

Phase I : This phase includes a cautious trial of the drug in humans.

Phase II : This phase includes more depth than a clinical trial in normal patients and initial trials in disease patients.

Phase III : This phase consists of broad clinical trials in disease patients to ensure that the drug is of clinical benefit for what it claims for.

Phase IV : Postmarketing clinical trials are conducted only after the drug is passed by the FDA.

133 (c) When two structurally different chemicals produce the same clinical effect, it is known as therapeutic equivalence.

When two or more dosage forms of a drug contain the same amount of drug in each dosage form, it is known as chemical equivalence.

When the same drug in two or more dosage forms produces the same in vivo effect that can be measured by pharmacological responses or by control of a symptom or disease, it is known as clinical equivalence.

When a drug in two or more similar dosage forms produces an identical rate of drug absorption and superimposable area under the curve, the drug is said to be bioequivalent.

134 (b) Concentration of a drug at a receptor site is not included in bioequivalency studies. Peak height concentration, the time required to reach peak concentration, and AUC are used to evaluate the bioequivalency of two or more formulations of the same drug.

135 (c) A substance that kills microorganisms but not the bacterial spore is defined as a germicide.

Anything that kills bacteria is defined as a bactericide. The absence of viable microorganisms is defined as sterility. The process of destroying microorganisms is defined as disinfection. A substance that prevents the growth of microorganisms, but does not necessarily destroy them, is known as an antiseptic.

136 (c) 1 quart of solution contains 960 cc of solution. Therefore the quantity of drug in 1 quart of 0.45% solution is :

$$\begin{aligned} &= 960 \times 0.45 / 100 \\ &= 4.32 \text{ grams} \end{aligned}$$

137 (a) The sterilization methods are divided in five different categories :

- I Moist heat sterilization
- II Dry heat sterilization
- III Gas sterilization
- IV Filtration
- V Radiation

Moist heat sterilization: It is the most widely used method for sterilization. The cause of death of organisms is attributed to coagulation of the cellular protein of the organism. The substance should be kept under pressure for at least 15 minutes at a temperature of 121° . Moist heat sterilization is not the suitable method sterilization of petroleum jelly, mineral oil, greases, waxes and talcum powder.

Dry heat sterilization : It is the suitable method to sterilize oily substances such as mineral oil, waxes and greases. Because it is less efficient compared to moist heat, the substance should be kept for prolonged time under high temperature. The death of the organism is a result of an oxidation process.

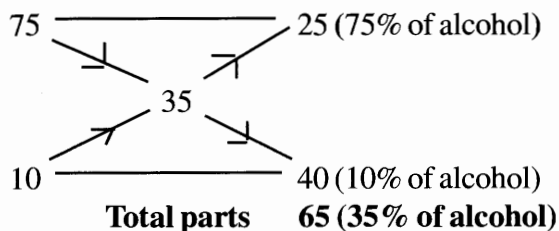
Gaseous sterilization: Ethylene oxide is the most widely used gas for sterilization. The advantage of ethylene oxide is that products can be sterilized and packaged for shipment since it can easily penetrate through plastic films and cartons. Formaldehyde and chlorine dioxide can also be used a for gas sterilization.

Filtration: It is one of the oldest methods of sterilization. It removes the particulate matter from the solution. It is a widely used method for the sterilization of heat sensitive substances. The common pore size of the membrane filter is 0.22 micrometer.

Radiation: Sterilization by radiation is commonly employed in hospitals to sterilize hospital supplies, vitamins, antibiotics, steroids, hormones, medical devices and tissue transplants, It can be achieved by use of electromagnetic radiation or particle radiation. U. V. radiation with a wavelength of 253 nm also serves as a germicidal agent.

138 (b) Ethylene oxide and formaldehyde are commonly employed gases for sterilization.

139 (a) 192.30 cc. To solve this problem use the alligation method :



Total parts	Parts of 75% require
65	25
500	?

$$= 500 \times 25/65$$

$$= 192.30 \text{ cc}$$

140. (c)

$$LD = \frac{Vd \times (Cp \text{ desired} - Cp \text{ observed})}{F \times S}$$

$$= 10 \times 70 \times (1.5 - 1.0)$$

$$= 350 \text{ mcg}$$

* Therefore approximately three tablets of 0.125 mg is required to produce a loading dose.

141 (b) Sterilization by U.V. radiation generally requires a wavelength of 253 nm.

142 (c) 1 teaspoon of solution of (30 mg/cc) contains 150 mg of a drug. This solution is diluted with water the 480 cc mark, therefore we can say that :

480 cc solution contains	150 mg of drug
1 cc solution contains?	

$$= 150 / 480$$

$$= 0.31 \text{ mg/cc}$$

143 (d) All tests can be used to identify the efficiency of laminar flow and the quality of steril-

ization. The laminar flow equipment is necessary to perform various sterility tests, aseptic filling and certain assembling operations. Laminar flow devices that deliver horizontal, vertical and curvilinear air flow are available.

For most sterility testing operations, the horizontal laminar flow is more preferable than vertical laminar flow since the former one is less likely to wash the organisms from operators hands or equipment into sterility test media.

The vertical laminar flow is most suitable for preparation of cytotoxic substances or drugs that may cause severe harm when inhaled, since the blow of air in this case is less likely to affect the operators (since it will move from top to bottom).

The velocity of air used in such devices is generally $90 \text{ fpm} \pm 20\%$. The filters that are generally used in laminar flow are known as HEPA (High Efficiency Particulate Air) filters.

Smoke tests (usually check the quality of air) and DOP (Dioctyl phthalate) tests usually employed to find out the efficiency of filters. Microbial tests check the effectiveness of HEPA filters.

144 (c) The rate of hydrolysis generally depends on the temperature and pH of the solution and the amount of water present. It is independent of pressure. It has been found that for each 10° rise in temperature, the rate of hydrolysis almost doubles.

145 (d) The % mark-up on prescriptions is 20%, therefore we can say :

For each \$100 cost the retail price is \$120.
For \$2250?

$$= 2250 \times 120 / 100$$
$$= \$ 2700$$

For 1000 tabs retail price is \$ 2700
For 30 tablets is ?
 $= 30 \times 2700 / 1000$
 $= \$81$

146 (b) Decarboxylation. The removal of carboxylic acid groups from the compound is known as decarboxylation.

147 (c) According to the International Pharmaceutical Federation, the maximum % of overages should be limited to 30% over the label potency of the ingredient.

Overages is defined as the addition of an extra active ingredient to balance the potency of the active ingredient due to degradation during its shelf life period.

148 (c) At the concentration of 65% w/w, sucrose retards the growth of microorganisms.

149 (c) Ingram's regimen consists of anthralin and UVB. Anthralin, by its DNA inhibition and antiproliferative action, helps in controlling psoriasis. UVB inhibits the DNA synthesis of epidermal cells.

The combination of Coal tar and UVB is known as Goeckerman regimen. Coal tar is a mixture of thousands of hydrocarbons which by their enzyme inhibition and antimitotic actions are useful for psoriasis.

150 (a) Pulmozyme (Dornase alfa) is indicated for the treatment of cystic fibrosis. It reduces the viscosity of sputum by helping in the breakdown of DNA nucleus of neutrophils (due to infection of the lung). Pharyngitis, apnea, voice alternation, and laryngitis are commonly reported side effects of the drug. The recommended dose of the drug is 2.5 mg via inhalation once daily.

$$151 \text{ (a)} \quad \text{pH} = \text{pKa} + \log \frac{\text{salt}}{\text{acid}}$$

$$7 = 5 + \log \text{salt/acid}$$

$$2 = \log \text{salt/acid}$$

$$100 = \text{salt/acid}$$

152 (b) Ocusert pilo 20 delivers 20 mg of pilocarpine per hour for 7 days. It is indicated for the treatment of glaucoma.

153 (c) Dorzolamide inhibits the carbonic anhydrase enzyme that is responsible for the production of aqueous humor in the eyes. It is indicated for the treatment of glaucoma.

Timolol is classified as a beta blocker, and it appears to lower the intraocular pressure of the eyes by inhibiting production of aqueous humor. Other agents in this same class are Betaxolol and Levobunolol

Dipivefrine is a prodrug of epinephrine. It is converted into epinephrine by enzymatic hydrolysis inside the eyes. It is a sympathomimetic agent that inhibits the production of the aqueous humor and increases the outflow of the aqueous humor. This results in the reduction of intraocular pressure of eyes.

Latanoprost increases the outflow of the aqueous humor and decreases the intraocular pressure of eyes.

154 (c) According to Fried's formula :

$$= \frac{\text{age in months}}{150} \times \text{adult dose}$$

$$= \frac{15 \times 325}{150}$$

$$= 32.5 \text{ milligram.}$$

For each 325 mg dose 0.6 cc is required
For 32.5 mg of dose ?

$$= 32.5 \times 0.6/325$$

$$= 0.06 \text{ cc}$$

155 (b) Triphasic oral contraceptives generally affect the follicular, ovulatory and luteal phases of the menstrual cycle and provide a more favorable effect than biphasic and monophasic contraceptives.

It is formulated with a low progesterone content. The only disadvantage associated with the use of triphasic is its lack of availability of uniform direction for taking oral contraceptives.

156 (a) The follicular phase is dominated by estrogen.

157 (c) Metabolic acidosis occurs due to loss of bicarbonate from the body. It stimulates the respiratory center to increase excretion of CO_2 from the body.

It can be further subdivided into metabolic acidosis with normal anion gap and metabolic acidosis with elevated anion gap.

Metabolic acidosis with a normal anion gap generally occurs due to a loss of bicarbonate from the body such as hypokalemia.

Metabolic acidosis with elevated anion gap occurs due to overproduction of organic acids such as lactic acids and formic acids.

It can be corrected by administration of I.V. sodium bicarbonate to an elevated arterial pH.

158 (c) Pyrethrin acts as a contact poison that disturbs the parasites' nervous system. It is used as a scabicide and pediculicide agent.

159 (a) Guaifenesin is a cough expectorant; an agent that may help in excretion of cough. Dextromethorphan, benzonatate and diphenhy-

dramine are antitussive; agents that may suppress the cough production.

160 (b) HbA_{1c} is defined as a stable complex of glucose and hemoglobin. It remains stable up to 120 days. The higher the blood glucose level, the more the fraction of glycosylated hemoglobin will be formed. It indicates the average blood glucose values over 3 to 4 months and helps in assessing overall glycemic control.

A value of HbA_{1c} 6% indicates a plasma glucose concentration of 120 mg/dL. Each 1 % change indicates approximately 30 mg/dL of mean plasma glucose concentration.

161 (d) 4.28 meq.

Equivalent weight = $\frac{\text{molecular weight}}{\text{number of valence}}$

$$\text{Equivalent weight} = \frac{151.85}{2} = 75.92$$

Milliequivalents = $\frac{\text{Weight in milligram}}{\text{equivalent wt}}$

$$= \frac{325}{75.92}$$

$$= 4.28 \text{ meq}$$

162 (d) Insulin therapy is associated with hypoglycemia, lipotrophy and lipohypertrophy side effects.

Vigorous exercise, overdose of insulin and skipping meals leads to hypoglycemia.

It is recommended to rotate site of an insulin injection to avoid lipotrophy.

163 (d) Precose (Acarbose) is classified as an antidiabetic agent. It is indicated for the treatment of diabetes. It inhibits pancreatic alpha-amylase and alpha-glucosidase hydrolase enzymes. This may result in a smaller increase in blood glucose

following meals. It is contraindicated to use in patients with inflammatory bowel disease, colonic ulceration, and intestinal obstruction. Abdominal pain, diarrhea, and flatulence are reported side effects of the drug. The recommended dose of the drug is 25 mg to 50 mg t.i.d. with the first bite of each main meal.

164 (b) Confusion, tachycardia, difficulty in concentration and sweating are common symptoms associated with hypoglycemia. Bradycardia is not a symptom of hypoglycemia.

165 (b) Most oral sulfonylurea agents have been found to produce disulfiram like reactions with alcohol. Chlorpropamide is an oral sulfonylurea agent.

These drugs inhibit the aldehyde dehydrogenase enzyme that is responsible for converting acetaldehyde into acetic acid. The accumulation of acetaldehyde in the body produces throbbing headache, nausea and vomiting, common symptoms associated with disulfiram.

166 (c) Normal renal threshold value for glucose is 180 mg/dl.

167 (b) 250 cc of 0.9% NaCl solution contains 2.25 grams of NaCl.

Meq = $\frac{\text{Weight in milligram}}{\text{Equivalent weight}}$

$$= \frac{2250}{58.5}$$

$$= 38.5 \text{ milliequivalents of Na}^+$$

168 (b) Acarbose is an oral alpha-glucosidase inhibitor used in the management of NIIDM. In the case of hypoglycemia, it is recommended to use dextrose instead of table sugar (sucrose) since Acarbose may block the breakdown of table sugar.

169 (c) 10.34 days.

$$\begin{aligned}t_{1/2} &= 0.693/k \\ &= 0.693 / 0.067 \\ &= 10.34 \text{ days}\end{aligned}$$

170 (b) Vancomycin is indicated for the treatment of antibiotic-induced p.colitis and methicillin resistant infections. Therapy should be closely monitored for ototoxicity and nephrotoxicity. Parenteral administration of Vancomycin is indicated for methicillin resistant types of infections. Oral administration of Vancomycin is indicated for treatment of p.colitis.

Rapid infusion of Vancomycin has been associated with anaphylactoid reactions, hypotension, wheezing dyspnea and urticaria. It may also cause flushing of upper body and pain and muscle spasm of the chest and neck. This syndrome is known as "Red Neck syndrome". These reactions are usually resolved within 20 minutes, but sometimes may persist for several hours.

171 (d) All. The active ingredient of all the mentioned choices is Mesalamine (5-aminosalicylic acid). It is indicated for the treatment of ulcerative colitis. It is chemically related to acetylsalicylic acid. It inhibits cyclooxygenase enzymes and prostaglandin synthesis, resulting in inflammation of the colitis. Anaphylaxis, diarrhea, abdominal cramps, G.I. ulcers and bleeding are reported side effects of the drug. The recommended dose of the drug is 1 gram q.i.d.

172 (b) Excessive secretion of the thyroid hormone causes Grave's disease. Staring eyes, weight loss, soft skin, fast heartbeat, high BMR and a sharp and anxious mind are the symptoms of the Grave's disease.

173 (b) Thyroid hormone deficiency causes cretinism in children and myxedema in adults. The basal metabolic rate is low. A puffy face with dry skin, slow speech, amenorrhea, slow pulse and scanty hair are signs and symptoms of myxedema.

A bloated face with idiotic looks and protruding eye balls are signs of cretinism.

174 (b) Tapazole (Methimazole) is classified as an antithyroid agent. It is indicated for the treatment of hyperthyroidism. The recommended dose of the drug is 15 mg to 40 mg per day. It should be avoided by pregnant women because of the serious side effect of agranulocytosis.

175 (d) All. Liothyronine is associated with numerous side effects such as headache, palpitation, tremor and diarrhea, and is less recommended for treatment of hypothyroidism. Desiccated thyroid preparations have a variable T3 and T4 ratio and therefore are less recommended by physicians. Levothyroxine is the most recommended thyroid supplement for treatment of hypothyroidism.

176 (a) Wellbutrin (Bupropion) is classified as an antidepressant agent. It is indicated for depression and smoking cessation therapy. It reduces the urge to smoke. Seizure is the principal side effect of the drug. The recommended dose of the drug is 100 mg t.i.d.

177 (d) All. Ticlopidine, Aspirin and Clopidogrel are platelets aggregations inhibitor drugs. They are indicated for the prevention of heartstroke. Bleeding is the principal side effects of these drugs.

178 (b) Calcitriol and Dihydroxycholesterol are indicated for the treatment of hypocalcemia by mobilizing bone calcium into blood. They are also indicated for treatment of tetany, idiopathic tetany and hypoparathyroidism.

The other choices such as Estrogen, Calcitonin salmon and Alendronate Na are indicated for treatment of osteoporosis by mobilizing blood calcium into the bone.

179 (d) All. Dihydroxycholesterol is indicated for treatment of tetany, idiopathic tetany and hypoparathyroidism.

180 (c) Cold and clammy skin, convulsion, confusion, respiratory depression and pinpoint pupil constriction are signs of opioid analgesic overdose.

181 (d) 30.13 minutes.

$$\begin{aligned}t_{1/2} &= 0.693 / K \\&= 0.693 / 0.023 \\&= 30.13 \text{ minutes}\end{aligned}$$

182 (a) Type I borosilicate glass is most chemically resistant and least leachable. It is composed of silicon dioxide and boric oxide. It has a low thermal coefficient of expansion.

Type II soda-lime treated glass and Type III soda-lime glass are composed of a high proportion of sodium and calcium oxide. This will make glass chemically less resistant.

Both these glasses can melt at low temperatures and have a high thermal coefficient of expansion.

183 (b) A class 100 room is defined as an environment that contains no more than 100 particles per cu ft of 0.5 μm or larger size. Laminar flow of a HEPA filter should meet the standard for class 100 as defined by Federal standard.

A class 10,000 clean room is a conventional clean room so it is less appropriate to carry out aseptic techniques.

184 (b) A HEPA filter is described as a High Efficiency Particulate Air filter. It is employed with Laminar flow for preparation of aseptic parenteral products. It is used for a class 100 clean rooms as defined by Federal standard. Smoke test, DOP test and microbiological essays are applied to find out the efficiency and quality of air provided by a HEPA filter. It has an efficiency of removing 99.97 % particles of 0.3 μm or larger.

185 (b) The process of removing 0.2 μm or larger particles, including microorganisms from parenteral solution is defined as "cold sterilization". Removing 2 μm or larger particles from the solution is defined as the polishing of the solution.

186 (a) Lyophilization is a process of drying in which water is removed by process of sublimation after a product frozen. This process is used to store pharmaceutical products which are relatively unstable in aqueous solution or are heat sensitive.

The major disadvantage associated with this process is its high cost.

187 (d) Sterility tests, pyrogen tests and particulate evaluation tests are important quality assurance tests for parenteral solution.

In sterility testing, a sample from the final products are incubated with various cultures to detect the presence of microorganisms. If the growth of microorganisms is found, the sample would be failed sterility test.

In pyrogen testing, the fever produced by the test solution (due to presence of pyrogen) in rabbits is counted as a positive response. Pyrogen tests cannot be used to identify the presence of pyrogens for the type of the solution or drugs which may mask the fever response. Rabbit is the choice of animal for pyrogen tests since it may sensitize to pyrogen the same way as the human body does. The new pyrogen test is known as a Limulus test, and is generally carried out in vitro, based on the formation of gel or color in the presence of pyrogen in the culture of Limulus polyphemus. It is more rapid and of greater sensitivity than the rabbit test.

The third test generally puts stress on the presence of any particulate matter. The size of erythrocytes in the blood is 4.5 μm in diameter and therefore particles of more than 5 μm in diameter should be considered the basis of evaluation.

188 (c) Body posture, facial expression and distance of the patient are nonverbal communications. They generally describe the patients condition. Open ended questions are not a part of non-verbal communication. i.e What kinds of symptoms have you been experiencing ?

189 (b) An HMO (Health Maintenance Organization) is a private or nonprofit organization that includes all the important components of a health care delivery services such as physicians, hospital, and long-term care facilities. They provide these facilities to the consumer by taking a fixed prepaid amount of fees from them. The additional services are also provided for additional payments as the need arises. They offer a combined package of primary physicians, physicians specialized for various diseases, hospitals and long-term care facilities. They are generally classified into four different categories :

Staff model HMO : Staff model HMO generally employs the physicians and owns the facilities. They provide services to a consumer for a fixed monthly fee on a yearly basis. The services provided by this kind of HMO are independent of services used by consumers or patients.

Group model HMO: Group model HMO directly contacts the group of the physicians to provide services to consumers on a capitation basis or on a fee basis.

Independent Practice Association: It is also known as IPA. It is one of the fast growing HMO types that contacts the physician on an individual basis and pays them fees for services with a profit sharing plan.

Preferred Provider Organization: It is basically the same as IPA, except the consumer/patient/member has a choice to select the physician that is out of the HMO network.

190 (d) All. The disadvantage associated with mail-order pharmacy services are :

- I. A lack of pharmacist counseling.
- II. A lack of review of patient's profile.
- III. The use of recycled prescription drugs.

191 (b) To cut down unnecessary hospitalization costs, the Prospective Payment system is introduced. Generally, the consumer/patient pays fixed amounts of fees to its primary insurance company such as Bluecross Blueshield, Signa Health Care etc. When a patient visits the physician for any existing problem, the physician prescribes him unnecessary tests that are not required by the patient. Patients do not care for those tests since he/she have to pay only a fixed amount of fees and the rest of the cost of such tests is fulfilled by primary insurance companies. This is a burden to the insurance companies. To stop unnecessary hospitalization of patient, Congress developed a prospective payment system. This system precalculates (by considering all the factors) the cost of hospitalization associated with particular disease. For Example, the cost of hospitalization for coronary bypass surgery (including minimum days required to stay in hospital, physician fees of hospitals, rent of room for hospital etc.) is listed as \$ 2000. If the hospital produces a bill for \$5000, the insurance will only pay \$ 2000 as listed under DRG (Diagnosis Related Groups). This will discourage hospitals from keeping the patient for a longer time then required to save health care cost burden.

Normally the prospective payment system is interpreted as any service cost you pay in advance for services that have not been provided yet or may be provide in the future such as fixed monthly premium of insurances.

In a retrospective payment system you pay for the services after service completed such as paying the hospital at the time of discharge.

192 (c) Most hospitals are now ordering their medications from only one wholesaler and pay a small fee for the service (provided by the wholesaler) This is known as the Prime Vendor System.

193 (b) Drugs that are dispensed under the floor stock system are generally classified into two categories.

- I Free floor stock system
- II Charge floor stock system

Free Floor stock system: In hospitals, each nursing unit has a predetermined list of medications that can be given to patients free of charge such as acetaminophen, bisacodyl etc. These medications are not expensive and used in large quantities. The charge of such medications is generally included in the cost of hospital room.

The inventory of such medications is usually done on a spot basis by a pharmacy technician on a predetermined day of week.

Charge floor stock system: There are certain drugs that require immediate use after the physician prescribes them such as antibiotics, and certain pain medications. It is not practical to go to pharmacy each time to obtain them, and they must require be charged to a patient.

When a nurse removes such medications from a cabinet, he/she will pull the preprinted label from the medication and affix it to the inpatient prescription. This is used later for the replacement of drugs and to charge the patient.

194 (b) Gaze is not a vocal qualities. Pitch, tone and range express the qualities of personal voice.

195 (a) Closed ended questions should be answered only in the form of "yes" or "no".

To better serve the patient, pharmacists must develop skills of an active listening. Ask open-ended or direct questions, and interpret non-verbal communication (face expression, body posture, eye reflection, distance of the patient) successfully.

Active listening: This will allow the patient to define the problem completely. A pharmacist has to listen to the patient with complete attention. After a patient's speech is complete, the pharmacist has to assure him that he understood his medical problem and medical needs thoroughly.

Open-ended questions : This skill initiates patients to speak about their problems i.e. tell me about the symptoms you have been experiencing?

Direct-ended question: This type of question emphasizes on a specific inquiry, i.e. how long have you noticed pain in your bladder?

Nonverbal communication : Interpretation of nonverbal communication gives an idea about the patient's existing disease condition. i.e. facial expression, eye reflection, hand gestures, body posture.

196 (c) 1 drop to both eyes four times a day for 10 days.

197 (c) \$ 30

$$\begin{aligned}\text{Retail price} &= \text{CD} + \text{CD} \times \% \text{ mark up} \\ &= \$ 20 + \$ 20 \times 0.5 \\ &= \$ 20 + \$ 10 \\ &= \$ 30\end{aligned}$$

CD = Cost of drug

198 (b) \$ 71

$$\begin{aligned}\text{Retail price} &= \text{CD} + \text{Professional fee} \\ &= \$ 65 + 6 \\ &= \$ 71\end{aligned}$$

199 (d) Literature can be classified into three different categories: primary, secondary and tertiary

Primary literature: It contains articles and journals. Articles are generally defined as a study that describes step by step evaluation of a drug including experimental procedure, data collection, purpose of experiment, conclusion and result of experiment. Examples: various journals and periodicals such as Drug Topic, Pharmacy Times, Hospital Pharmacy, Us Pharmacist.

Secondary literature: It represents two types of sources : abstracting and indexing, e.g. inpharma reactions, index medicus and Iowa drug information service. There are some important parameters in selecting secondary literature.

I Lag time : It describes the time elapsed between when a document was published in a journal versus when it was abstracted/indexed.

II Coverage of literature : The source of literature may be drug oriented or may be subject oriented. The selection of the source is solely dependent on where the source should be placed.

III Cost: It depends on when sources are available in different forms. The selection of the form of a source depends on the number of users and type of information provided.

Tertiary literature: Contains the reference sources in condensed and compact form such as drug fact comparisons, american hospital formulary, text books and reference books.

References	Example of References
Product oriented	PDR Red Book Facts and Comparisons Blue Book Non Prescription Drug

Drug oriented

Matriandale's The Extra Pharmacopeia
Hand Book of Injectable Drugs
Drug Interaction Fact
Hansten's Drug Interⁿ

Therapeutic oriented

Merck Manual
Applied Therapeutics
Clinical Pharmacy and Therapeutics

Dispensing oriented

Remington
USP-NF
Merck index

Poisoning informⁿ

Dreisbach's Handbook of Poisoning

200 (d) The author of an article is not an important consideration when selecting sources for secondary literature.

201 (a) Kitchen is more prone to accidental poisoning in children in the late morning.

202 (b) Pesticides and petroleum products accidental poisoning are more likely to occur in garage.

203 (d) All. Age, accessibility of poison and type of container are factors that increase chances of accidental poisoning.

204 (a) Schedule I controlled substances have the most potential for abuse, followed by schedules II, III, IV and V.

205 (b) The Poison Prevention Packaging Act was introduced in 1970 to prevent accidental poisoning due to overdose of a drug. This law requires drugs to be in a child resistant container. However there are several drugs that are exempt from this law. The list of those medications is as follows:

- * sublingual nitroglycerine
- * sublingual and chewable Isosorbide nitrate
- * methylprednisolone
- * cholestyramine powder
- * mebendazole
- * potassium supplements
- * prednisone
- * pancrelipase
- * oral contraceptives
- * colestipol powder
- * erythromycin ethyl succinate granules for oral suspension

206 (d) All. The following drugs require a PPI (Patient Package Insert).

- * estrogen and progesterone containing drug
- * intrauterine devices
- * isotretinoin
- * oral contraceptives
- * isoproterenol inhalation

207 (b) The correct DEA# for Mr. Bruce, Jacob is AB3245671. The first letter would be either A or B, which indicates dispensing the second letter stands for the first initial of the last name of the prescriber.

Follow is procedure to find out the authenticity of the DEA# for the physician:

- I First do the sums of first, third and fifth numbers. i.e. $3 + 4 + 6 = 13$
- II Then do the sums of second, fourth and sixth numbers. i.e. $2 + 5 + 7 = 14$
- III Multiply the sums of second, fourth and sixth numbers by 2. i.e. $14 \times 2 = 28$

IV Add this sum to the first sum. i.e. $13 + 28 = 41$. The last digit of these sums is suppose to match the ninth digit of the DEA #. i.e. AB3245671

208 (b) Dispensing controlled substances V without a prescription requires:

I Not more than 240 cc or 48 solid dosage form units of any controlled substance containing opium or more than 120 cc of other controlled substances.

II The purchaser should be at least 18 years of age.

III A bound red book should be maintained with the name and address of purchaser, the quality of the controlled substance sold and the pharmacist's initials with the date the drug was dispensed.

IV Dispensing should be done only by a pharmacist.

209 (c) The partial filling of controlled II drugs should be done within 72 hours of the initial filling.

210 (d) 278.80

The mean blood pressure for Mr. Moose can be calculated as follows:

$$\frac{282 + 262 + 275 + 285 + 290}{5} = 278.8$$

211 (c)

$$\frac{P1V1}{T1} = \frac{P2V2}{T2}$$

$$P1 = 745 \text{ mm Hg}$$

$$V1 = 45 \text{ cc}$$

$$T1 = 25 + 273 = 298^\circ \text{K}$$

$$P2 = 760 \text{ mm Hg}$$

$$V_2 = ?$$

$$T_2 = 0 + 273 = 273^\circ \text{K}$$

$$\frac{745 \times 45}{298} = \frac{760 \times V_2}{273}$$

$$V_2 = \frac{273 \times 745 \times 45}{298 \times 760} = 40.41 \text{ cc}$$

212 (c) Invariant. The phase rule generally is described by the following formula:

$$F = C - P + 2$$

F = Number of degree of freedoms

C = Number of components

P = Number of phases

$$F = 1 - 3 + 2 = 0$$

213 (a) Norvasc (Amlodipine) is classified as a ca-channel blocker. It is indicated for the treatment of hypertension. The recommended dose of the drug is 10 to 20 mg b.i.d. Hypotension, tachycardia, nausea, and vomiting are reported side effects of the drug.

214 (b) The part of the molecule that absorbs ultraviolet or visible light is known as the chromophore. Different chromophores such as carbonyl compounds, acetone, aldehyde and ketones absorb different wavelengths of radiation, which are used to identify unknown compounds.

215 (a) 1 gram molecular weight (moles) of solute in 1000 cc of the solution is known as Molarity (M).

Molality(m): 1 gram molecular weight (1 mole) of solute in 1000 grams of solvent.

Normality(N): 1 gram equivalent weight of solute in 1000 cc of solution.

Mole fraction: Ratio of the moles of one component of solute to the total moles (solute + solvent).

216 (a) 0.714 Molarity.

Moles of $\text{NaHCO}_3 = \frac{\text{weight in gram}}{\text{mole weight}}$

$$= \frac{60 \text{ grams}}{84 \text{ gram/mole}}$$

$$= \frac{0.714 \text{ moles in}}{1000 \text{ cc of solution.}}$$

217 (b) 51.7 gm / eq

Equivalent weight = $\frac{\text{Molecular weight in gm}}{\text{number of valence}}$

$$= \frac{310 \text{ gm/mole}}{6}$$

$$= 51.7 \text{ gm/mole}$$

218 (b) Osmosis: A process where the semipermeable membrane only allows the solvent molecules to pass from one compartment to other.

Diffusion: A process where both solvent and solute molecule migrate freely.

219 (c) The conductance of solution contains 1 gram of equivalent weight of the solute measured in a cell; when both electrodes are spaced 1 cm apart from each other, it is known as equivalent conductance.

220 (b) $10^{-5} \text{ H}_3\text{O}^+$ concentration.

$$\text{PH} = -\log (\text{H}_3\text{O}^+)$$

$$5 = -\log (\text{H}_3\text{O}^+)$$

$$\text{H}_3\text{O}^+ = 10^{-5} \quad \text{H}^+ \text{ ion concentration.}$$

221 (b) $PK_B = 10.5$

$$PK_W = PK_A + PK_B$$

$$14 = 3.5 + PK_B$$

$$PK_B = 10.5$$

222 (c) 1.24

$$PH = PKa + \log \frac{\text{salt}}{\text{acid}}$$

$$6 = 4.76 + \log \frac{\text{salt}}{\text{acid}}$$

$$\log \text{salt/acid} = 1.24$$

223 (a) 0.0230

$$\text{Beta max} = 0.576 \times C$$

$$\begin{array}{ll} \text{Beta max} & = \text{Maximum buffer capacity} \\ C & = \text{Concentration in mole/lit} \end{array}$$

$$\begin{array}{ll} \text{Beta max} & = 0.576 \times C \\ & = 0.576 \times 0.04 \text{ mole/lit} \\ & = 0.0230 \end{array}$$

224 (b) The increase in mutual solubility of two partially miscible liquids by the addition of a third substance is known as Blending.

Catalyst: A substance that increases the rate of reaction without being involved in the reaction.

Promoter: The substance that increase the activity of catalysts i.e.. A Cu^{++} ion promotes the catalytic action of an Fe^{+3} ion in the decomposition of H_2O_2 .

225 (b) A substance containing two or more donor groups may combine with metal to form a special class of complex known as chelates. A molecule with two donor groups is known as bidentate and molecules with three donor groups are known as tridentate. EDTA has 6 donor groups and binds to metal with 6 attachments, and is therefore known as hexadentate.

Chlorophyll and hemoglobin are naturally occurring chelating agents. EDTA is a synthetic agent. It is used as an antioxidant in most pharmaceutical preparation. It is also used as a sequester (chelating agents and metal ions form a water soluble complex, i.e. EDTA and Ca^{++} ion complex); this property of EDTA helps to remove calcium ions from the hard water.

226 (b) Hydrolysis. The degradation of aspirin to acetic acid and salicylic acid in the presence of water. Most pharmaceutical decomposition can be classified either as oxidation or hydrolysis.

227 (c) Dispersed particles need a high concentration of electrolytes to precipitate out from colloidal solution.

Colloidal solution is classified in three different categories:

I Lyophilic colloid: The disperse particles of such colloids have a high affinity for dispersion medium. The disperse phases of such colloids primarily consist of organic molecules. The viscosity of this type of colloid increases with an increase in concentration of disperse phase, and may convert from a sol to a gel at a high concentration of dispersed particles. The system is usually stable in the presence of small concentration of electrolytes; however at a higher concentration of electrolytes it may reduce the affinity between disperse phase and medium, and may precipitate out colloids (known as salting out effect).

II Association or Amphiphilic colloids: This type of colloid particle has an attraction for aqueous and nonaqueous dispersion medium. The size of individual particles is below the colloidal range, and particles consist of a hydrophilic and lipophilic portion of body. At a particular concentration particles form aggregates (micelle) known as micelle concentration.

The viscosity of colloids increases with an increase in micelle concentration. The hydrophilic or lipophilic portion of a molecule is solvated depending on the type of dispersion medium. The addition of electrolytes generally results in precipitation of colloids.

III Lyophobic colloids: The disperse phase of such colloids consists of inorganic particles such as gold and silver. The attraction between disperse phase and dispersion medium is very little, and therefore they can easily precipitate out in the presence of even small concentration of electrolytes. The viscosity of such colloids do not increase with an increase in the concentration of disperse particles.

228 (b) Disperse systems can be classified into three different categories:

I Molecular dispersion: The particle size of this disperse phase is generally less than 1nm. Particles of the disperse phase cannot be seen even under an electron microscope. They pass through ultrafilter and semipermeable membranes such as oxygen and glucose

II Colloidal dispersion: Particles cannot be seen under an ordinary microscope, but are visible under an electron microscope. They pass through the filter membrane but not through the semipermeable membrane. They are sized between 0.5 microns to 1 nanomicon; silver colloidal sol is one example.

III Coarse dispersion: Particle size is greater than 0.5 micrometers. They are visible under a microscope. They do not pass through filter paper; emulsion and suspension are examples.

229 (b) Colloidal mercury is a diagnostic agent for syphilis, colloidal gold is for paresis. Colloidal copper has been used for treatment of certain types of cancer. Colloidal silver chloride, silver iodide and silver protein have been used as germicides.

230 (b) The random movements of colloid particles in colloidal sol due to the bombardment effect of particles of dispersion medium is defined as Brownian motion. It was first observed by Robert Brown in 1927. The Brownian motion of colloidal particles decreases with an increase in viscosity of dispersion medium, and increases with a decrease in particle size.

231 (b) The protective property of colloid is expressed by "gold number". It is the minimum weight in milligrams of the protective colloid required to prevent a color change from red to violet, in 10 cc of gold SOL with the addition of 1 ml of 10% solution of sodium chloride.

232 (b) 52%

$$V_p = \frac{W_p}{D_p}$$

$$\begin{aligned} V_p &= \text{volume of particle} = ? \\ W_p &= \text{weight of particle} = 150 \text{ gm} \\ D_p &= \text{density of particle} = 3.5 \text{ gm/cm}^3 \\ B_p &= \text{bulk volume of particle} = 90 \text{ cm}^3 \end{aligned}$$

$$V_p = \frac{150}{3.5} = 42.85 \text{ cm}^3$$

$$\begin{aligned} \text{Porosity} &= B_p - V_p \\ &= 90 - 42 = 47.15 \text{ cm}^3 \end{aligned}$$

$$\% \text{ Porosity} = \frac{B_p - V_p}{B_p} \times 100$$

$$= \frac{47.15 \times 100}{90}$$

$$= 52 \%$$

233 (c) Flow property of particles is affected by particle size, shape, porosity, density and surface texture of particles. It does not relate to the color of particles.

234 (b) The more flocculated suspension, the higher the yield value or shearing stress required to obtain the flow. Please read answer of question 51 to get more information about different kinds of flow.

235 (b) 4 times.

$$\begin{aligned}\frac{dx}{dt} &= K(a-x)(b-x) \\ &= K(a-x)^2 \text{ (where } a=b) \\ &= K(A)^2\end{aligned}$$

Now the concentration of reactant is double, so we can say $A = 2A$:

$$\begin{aligned}&= K(2A)^2 \\ &= 4KA^2\end{aligned}$$

236 (b) Sodium carboxyl methylcellulose exhibits the pseudoplastic flow.

237 (c) A dilatant system is recognized by the shear thickening system.

238 (b) The property of flow that generally converts to a solution from a gel upon applying stress, and converts back to a gel from a sol upon resting is known as thixotropy.

239 (d) The principal of thixotropy is applied in the preparation of various pharmaceutical products such as suspension, emulsion, lotion, parenteral depot preparation etc. It is not applied for preparation of elixir.

240 (d) Sedimentation of the flocculated particles is generally affected by size of the flocculated particle, porosity between sediment particle (high porosity sediment can redisperse more easily than low porosity sediment), compaction and rearrangement between sediment particles. It does not affect by the shape of the particles.

241 (b) Instability of pharmaceutical emulsion can be classified in to three different categories:

- I Creaming
- II Breaking
- III Phase inversion

I Creaming: It occurs due to flocculation of globules of the internal phase. It is not a potential cause of instability of emulsion, however occurrence of creaming is a potential step towards complete breaking of emulsion. The rate of creaming can be expressed by Stoke's law.

$$V = \frac{d^2 (P_s - P_o) \times g}{18n}$$

- d = diameter of particle in cm
- P_s = density of disperse phase
- P_o = density of dispersion medium
- g = gravitational force
- n = viscosity of medium

Upward creaming: It occurs when the disperse phase is lighter than dispersion medium, i.e. most of w/o type emulsions. The rate of sedimentation is negative.

Downward creaming: When the disperse phase is denser than dispersion medium. In most of the o/w type emulsions, the rate of creaming is in a downward direction. The rate of sedimentation is positive.

The diameter of globules is a major factor in determining rate of sedimentation. Doubling of diameter increases the rate of sedimentation four times. The difference between densities of disperse medium and disperse phase also determines the rates of sedimentation. The higher this difference, the greater the sedimentation velocity. By increasing force of gravity through centrifugation, the rate of creaming can be increased. Only the viscosity of disperse phase is inversely proportional to the rate of sedimentation or creaming.

II Breaking: It is different than creaming, since creaming is a reversible process while breaking is irreversible. Breaking generally results in separation of the internal and external phase. It cannot be reformulated.

Critical point: Theoretically if spheres are arranged in the closest packing, they cannot occupy more than 74% of the total volume regardless of size. This means if one wants to prepare O/W emulsion by incorporating more than 74% of volume of oil, the oil globules will collapse and break the emulsion. This value, where you cannot incorporate more than 74% volume of internal phase in emulsion, is known as the critical point.

Phase Inversion: It is simply described as changing of the internal and external phase. For example, an O/W emulsion that stabilizes with Na stearate can be changed to W/O emulsion by the addition of Calcium chloride.

Phase inversion also results by slow addition of the external phase. For example, O/W emulsion can be inverted to W/O emulsion by the addition of a small amount of oil each time until the phase inverted.

242 (b) Unlike emulsion, microemulsions are clear solutions and transparent. It is thermodynamically unstable. The diameter of droplets of such emulsions lies between 10 to 200 nm. It is helpful to solubilize the drugs in pharmaceutical systems.

243 (b) The rate of release of a drug from a gastrointestinal therapeutic system (GITS) or OROS follows zero order kinetic reaction. The principal advantage of such a system is that release of the drug is independent of the pH of gastric fluid.

The GITS system consists of the drug particles surrounded by a semipermeable membrane. There is a small hole in the top of the

dosage form. When patients swallow tablets, GI juice starts to penetrate through the semipermeable membrane of the tablet and dissolves the drug. This will create concentration gradient between saturated solution of the drug and outer G.I. fluid. The saturated solution of drug slowly comes out through a small hole in the tablet by zero order kinetic.

244 (b) Medically indigent people (a group of people who cannot afford to pay for medical care although they may or may not be able to pay for other goods and services) have medical insurance generally paid or covered by Medicaid.

Most of hospitals receive their payment for services they provided through third party insurances. Medicare, Medicaid, Blue Cross Blue Shield and other commercial insurance companies are examples of third parties.

Medicare: It was introduced in 1965. It is also known as Title XVIII of the Social Security Act. It provides services for persons age 65 or older and for certain disabled patients. It was subdivided in to two parts. Part A and Part B. Part A generally pays the bill for hospital services while part B pays the bill for doctor services, however both parts require "copayment" from the patients.

Medicaid: It is known as Title XIX of the Social Security Act or as a "state welfare" program. It helps to pay the bill for medically indigent persons. This program is conducted on state level basis and therefore provisions of this program vary from state to state. Medicare and Medicaid combine 50% of reimbursement in average hospitals.

Blue Cross: It is not a government related insurance plan. 18% of reimbursement in hospitals is provided by Blue Cross. It offers a variety of services by taking a prepaid monthly fee from the enrolled customers. It reimburses the

hospital on the basis of cost; some of the Blue Cross plans reimburse on the basis of a certain % of total cost. It offers more comprehensive coverage than other commercial insurances.

Commercial insurances: They offer a variety of services with a condition that an initial certain amount of money should be spent by the consumer which is known as a "deductible". Also, most of them do not cover charges for certain types of services. They also collect the prepaid fixed monthly fees from the enrolled customers.

245 (c) The payment system can be classified in to two different categories:

- I Retrospective payment
- II Prospective payment

Retrospective payment: In this type of payment service, payment is generally made after the service is provided by the hospital. The payment depends on the service actually provided by the hospital during the patient's stay. There is little incentive for a hospital to keep a patient in the hospital because payment increases as more costs are incurred. It is not preferred by third party insurances.

Prospective payment: In this type of payment service, payment is (predetermine on the basis of illness) should be paid in advance to the hospital regardless of the patient's stay at the hospital, the number of tests performed on the patient, or the number of tablets used by the patient. If a predetermine rate for cardiac bypass surgery is \$2500, then the insurance company will only pay this amount to the hospital regardless of costs incurred during hospitalization. This will discourage hospitals from keeping a patient for a prolonged time.

246 (d) All are the examples of a prospective payment system (PPS). This was introduced in 1982. This payment system usually pays the hospital on the basis of DRG (Diagnostic Related

Group) services. DRG includes lists of different kinds of illnesses and a fair amount of cost is required to treat such illnesses. Under this payment service, the hospital will reimburse a predetermine amount specific to the DRG in which the patient is classified. This single payment will cover the entire episode of care regardless of the patient's stay at the hospital, the number of tests performed, or the number of drugs that are used.

There are two national DRG rates-one is applied for urban areas and another for rural areas. The urban rate in 1984 was \$2837 for rural was \$ 2264.

This rate is then multiplied with weighed factor (calculated on the basis of cost of hospitalization for particular illness), and will give a predetermine cost for a particular disease. For example, the weighed factor for acute endocarditis was 2.6 in 1984, therefore DRG cost of this disease in an urban area would be $2.6 \times 2837 = \$ 7376.20$. It means for any patient with a diagnosis, of acute endocarditis when admitted to a hospital in an urban area, the third party will pay the hospital \$7376.20 under the prospective payment system of 1984.

247 (d) Preferred Provide Organization (PPO) is a group of hospitals and physicians that provide services to employers and third party insurances to provides comprehensive services to providers on a fee-for-service basis. The subscriber can negotiate for the price of fees.

The freedom of choice is limited to a number of hospitals and physicians. The discounted fees generally create pressure to provide services on a reduced cost basis, however it is more preferred since it provides more rapid payment to provider.

248 (a) Dispensing fee method is the most acceptable method for pricing of prescription drugs. In this method a fixed amount of fees (cal-

culated on the basis of direct, indirect and fixed cost of pharmacy services including the profit margin required) is added to the acquisition cost of drugs.

The per diem charge method is calculated on the basis of average drug cost per patient per day, average pharmacy service cost per patient per day and the required profit margin. This will make up the single price to charge a patient per day the during their stay in the hospital.

249 (d) DUR (Drug Utilization Review) is a very useful tool for a pharmacy manager to keep the cost of a pharmacy under control. This program will give more accurate information on the cost of hospitalization and will also consider the cost of drugs. For example, patients with hypertension can be prescribed Verapamil (due to less cost) instead of Norvasc (due to high cost). On the basis of cost Verapamil is more preferable than Norvasc. But one should also focus on the cost of hospitalization that may occur, since Verapamil might not be as effective as Norvasc in the treating hypertension.

Retrospective utilization review is useful for identification of areas warranting scrutiny. Initially, one has to focus more on expensive drugs or the diagnosis of diseases that have a high cost of drugs. It should be carried out by monitoring the length of stay of a patient in the hospitals, the number of drugs used per patient, the number of doses of drugs used per patient, and the cost of drugs per patient.

250 (a) Primary literature is the largest and most current information source.

251 (b) The Pharmacy and Therapeutic committee (P and T Committee) should review reported ADR (adverse drug reaction).

252 (c) Statistical tests can be divided into Parametric and Non-Parametric tests.

Parametric statistics are the most popular data analysis procedures that assume that data are from populations that are normally and independently distributed. The population of Parametric tests must have the same variances. Examples of Parametric statistic are t-tests, mean, and standard deviation.

Non-Parametric statistics are also known as “distribution free” statistics. They do not require assumption of same variances. Their observations are independent. Examples of Non-Parametric statistics are mode, median and chi-square tests.

✓ **253 (c)** Analysis Of Variance (ANOVA) is used to test for significance of difference between two or more group means. The t-test is employed to test for significance of difference between two group means.

Regression analysis is the most useful technique for research in behavioral science.

254 (d) All. Overutilization, underutilization and administration of medications at inappropriate times are the most common errors associated with compliance.

255 (d) All. Noncompliance is defined as a failure to follow the prescribed regimen due to various physical, emotional and psychological factors. For example, old age, unpalatable taste of medication, fear of drug dependency, number of drugs in the regimen, duration of therapy and frequency of administration are factors that may discourage patients from following a prescribed regimen.

256 (a) Hypersensitivity reactions can be classified into four different categories:

- I Type I hypersensitivity
- II Type II hypersensitivity
- III Type III hypersensitivity
- IV Type IV hypersensitivity
- V Type V hypersensitivity

Type I hypersensitivity reactions: IgE immunoglobulin plays an important role in this type of hypersensitivity. The excessive secretion of IgE in response to specific antigens may cause this type of reaction. Common allergens that may cause this type of hypersensitivity are pollens of trees, grasses, various plants, fungi, soybeans, peanuts, certain dairy products, drugs that bound to haptens such as penicillin, cephalosporin, hormones and certain vaccines.

It is characterized by the presence of urticaria, itching, nasal congestion, constriction of bronchioles, tear secretion, runny nose, itchy eyes, diarrhea and vomiting. Atopic dermatitis is a principal symptom associated with Type I hypersensitivity.

Type II hypersensitivity reactions: The immunoglobulins IgM and IgG play an important role in this type of hypersensitivity. They form the immune complexes with specific cell antigens which result in cytotoxicity of cells. It is commonly reported with Rh disease, with certain drugs and their metabolites such as penicillin, cephalosporin, quinidine methyl dopa; it may result in drug induced hemolytic anemia. It is also reported with certain autoimmune diseases such as myasthenia gravis, Hashimoto's thyroiditis, autoimmune hemolytic anemia and thrombocytopenia.

Type III hypersensitivity reactions: They result due to a high load of antigens or to underproduction of antibodies. The immune complex between antigen and antibodies remains a prolonged time in, blood or at local tissue sites. It is reported with non-organ specific autoimmune disorders such as SLE or rheumatoid arthritis. It is also reported with bacterial and protozoal infections. Administration of antisera to achieve passive immunization may also result into such reactions.

Type IV hypersensitivity reactions are reported due to a prolonged immune response.

T-cells may play an important role in this type of reaction. Acute graft rejection, tuberculin test, contact dermatitis and infection caused by M. tuberculosis, M. leprae and listeria monocytogenes are examples of Type IV hypersensitivity reactions.

Type V hypersensitivity reactions are also known as autoimmune disorders. Normally, when antigens enter a blood stream, the body's protective mechanism produces antibodies against antigens. But sometimes the body produces antibodies against its own cells or body organs which will be identified by the body as a foreign cell; this will cause autoimmune disorder. This type of immunity is known as autoimmunity.

Autoimmunity can be subdivided into:

- I Organ specific autoimmunity
- II Non-organ specific autoimmunity

I In Organ specific immunities, such as Myasthenia gravis, Graves' disease, Hashimoto's thyroiditis, Multiple sclerosis, the body produces antibodies particularly against one of its organs.

II In Non-organ specific autoimmunity, the body produces antibodies against all the tissues. i.e. SLE, sjogren syndrome

257 (a) Pentam (Pentamidine) is classified as an antiprotozoal agent. It is indicated for the treatment of pneumonia caused by P. Carinii. Pneumonia. The recommended dose of the drug is 4 mg/kg/day for 14 days, via I.V. or deep I.M. Hypotension, tachycardia, nausea, phlebitis, and bronchospasm are reported side effects of the drug.

258 (c) Clozapine (Clozaril) is classified as an antipsychotic agent. It is indicated for the treatment of schizophrenia. The recommended dose of the drug is 300 mg to 600 mg per day, in two to three divided doses. Agranulocytosis, seizure,

cardiac abnormalities, and hyperpyrexia are reported side effects of the drug.

259 (c) Rheumatoid arthritis, Systemic Lupus Erythematosus and Sjogren syndromes are Type III hypersensitivity reactions. Contact dermatitis is classified as a Type IV hypersensitivity reaction.

260 (b) Graves' disease is classified as a Type V hypersensitivity reaction. Antibodies produced by the body act as agonists for TSH (thyroid stimulating hormone) receptors and may lead to hypersecretion of thyroid hormones. It is characterized by weight loss, soft skin, fast heartbeat, high BMR and anxious sharp mind.

261 (c) SLE (Systemic Lupus Erythematosus) is not an organ specific autoimmunity. In this disease, autoantibodies are formed against all or many tissues.

Myasthenia gravis: Autoantibodies formed by the body competitively inhibit the binding of acetylcholine to nicotine receptors. This will cause muscle weakness and fatigue. Neostigmine (anticholinesterase) is a drug of choice since it increases the concentration of acetylcholine at the receptor site.

Rheumatic fever: In this disease, antibodies formed by the body against streptococci also damage the cardiac muscle fibers.

Autoimmune pernicious anemia: Intrinsic factors play an important role in absorption of vitamin B₁₂. In certain patients, antibodies formed by the body act as antagonists for intrinsic factor which results into failure of association of vitamin B₁₂ and intrinsic factor. This will lead to poor absorption of Vitamin B₁₂ from GI tract and anemia.

Autoimmune disease of blood cells: In this disease, antibodies formed by the body start to destroy the normal cells in blood. i.e RBC, thrombocytes, neutrophils and lymphocytes.

Multiple sclerosis: T cells and macrophages are part of a body's protective mechanism. Sometimes these cell act as autoantigens and destroy the basic protein of myelin in CNS. This will cause spasticity. When these cells destroy myelin involved with the peripheral nervous system, it results in Guillain Barre syndrome. Baclofen and Dantrolene are drugs of choice.

Goodpasture syndrome: Antibodies formed by autoantigens cause glomerulonephritis and profound deterioration of kidney function. Immunosuppressive agents such as corticosteroid may help to a certain extent.

Thyroid abnormalities: They can be subdivided into three different categories: Myxedema, Graves' disease and Hashimoto's thyroiditis.

I Myxedema: Antibodies formed by autoantigens may act as antagonists for TSH receptors which will lead to hyposecretion of the thyroid hormone and myxedema.

II Graves' disease: Antibodies formed by autoantigens may act as agonists for TSH receptors which will lead to hypersecretion of the thyroid hormone.

III Hashimoto's thyroiditis: Antibodies formed by autoantigens may antagonize thyroid peroxidase effect, and may cause cytotoxicity, inflammation reactions and hypothyroidism.

262 (d) All. When antigens enter into the body, the protective mechanism of the body produces a large amount of antibodies from the lymphocytes to destroy it. These antibodies are polyclonal in nature, which means they are a mixture of antibodies produced by different cells of the body.

However, they all provide the same activity against antigens.

If we develop antibodies that are produced only from one cell the result is antibodies that may be much more specific and safer. This type of antibodies are known as Monoclonal antibodies such as Murine monoclonal antibodies, digibind and monoclonal antibodies.

Monoclonal antibodies do not exist in nature, they are produced. The administration of antigens into a lymphocytes of the spleen of a mouse may result in the production of monoclonal antibodies, however only small amounts of antibodies are recovered by this process. To produce a large amount of monoclonal antibodies, scientists mix lymphocytes with myeloma cells. This results in a hybrid cell of myeloma-B-lymphocyte generally known as hybridoma which is capable of producing a large quantity of identical monoclonal antibodies.

263 (a) Lasix (Furosemide) is classified as a loop diuretic. It acts on loop of Henle. It is indicated for the treatment of edema associated with CHF and hypertension. The recommended dose of the drug is 20 to 40 mg per day. Electrolyte loss, hypokalemia, hypotension, and nausea are reported side effects of the drug.

264 (b) Aldomet (Methyldopa) is classified as an antihypertensive agent. It is an alpha-2 receptor agonist. The stimulation of this receptor may prevent the release of adrenaline. It is indicated for the treatment of hypertension. Hemolytic anemia, toxic epidermal necrosis, bone marrow depression, sedation, and depression are reported side effects of the drug. The recommended dose of the drug is 250 mg b.i.d or t.i.d.

265 (b) The transfer of a drug from the stomach into the blood can be done by two ways: Passive diffusion or Energy mediated transfer also known as Active transport. The rate of passive diffusion of drugs greatly depends on the lipid solubility of the drug. Uncharged pieces (unionize) of the drug

may cross the cell membrane more easily than charged species (ionize) of the drugs. Ionization of the drug may reduce the lipid solubility of the drug and therefore make the drug less available to the blood.

266 (c) Plasma albumin is a major protein for the binding of various drugs. It mostly binds to acidic drugs. Basic drugs found to be bound to Beta globulin and acid glycoprotein.

267 (c) The biotransformation of drugs can occur in two ways:

- 1 Phase I reaction
- 2 Phase II reaction

Phase I reactions: It involves the processes of oxidation, reduction and hydrolysis. Most drugs metabolize by oxidation. It involves the enzyme NADPH-dependent mixed function oxidase. i.e Oxidative deamination, aliphatic and aromatic hydroxylation, N-oxidation and S-oxidation

Oxidized products of drugs make drugs more polar and more soluble in urine.

Reduction of a drug is only limited to certain type of drugs, such as drugs that contain ketone groups in a molecule. For example the well known anticoagulant drugs warfarin is metabolized by the reduction pathway in which the ketone portion of the molecule converts to the hydroxyl group by receiving hydrogen. This is similar to the way hydrocortisone and most steroidal (due to presence of ketone groups) agents metabolize by the reduction pathway.

Hydrolytic reaction is usually associated with drugs that have ester or amide bonds. Hydrolysis of these bonds may result in inactive metabolites such as Procaine, Procainamide, Acetylcholine, and Lidocaine.

Phase II reactions: Most of the phase I metabolized drugs additionally conjugate with certain endogenous groups such as glucuronyl, sulphate, methyl, acetyl and glutamyl. This will make a drug more polar in nature and more water soluble. This will help in rapid elimination of the drug from the body. This process is very helpful in preventing the body from toxic effects of drugs whose phase I reaction metabolites are highly toxic, such as acetaminophen.

268 (a) The precursor for 5-HT (Serotonin) is tryptophan. This neurotransmitter has a great importance in certain psychiatric disease such as OCD and depression. The most successful antidepressant agents (fluoxetine, sertraline, paroxetine, citalopram) are selective serotonin uptake inhibitors in the brain.

269 (a) Cardiac stimulation is one of the pharmacological actions of histamine. Histamine produces its effect by stimulation of Histamine (H_1) receptors and Histamine (H_2) receptors. Gastric acid secretion and cardiac stimulation effects are mediated through Histamine (H_2) receptors, and contraction of smooth muscles and vasodilation are mediated through Histamine (H_1) receptors.

270 (c) The list of prostaglandins with their actions is as follows.

<u>Name</u>	<u>Actions</u>
PGI_2	I Vasodilation II Inhibition of platelets aggregation
PGE_2	I Inhibition acid secretion II Stimulation of mucus secretion
PGF_2	I Bronchoconstriction II Contraction of uterus

PGD_2 I Vasodilation
II Inhibition of platelets aggregation

TXA_2 I Platelets aggregation
II Vasoconstriction

271 (b) Bradykinin is a substance responsible for causing dry cough.

272 (a) LDL (Low Density Lipoprotein) is an important risk factor in atherosclerosis.

273 (b) Thromboxane (TXA_2) is associated with aggregation of platelets.

274 (b) Atrovent (Ipratropium) is an atropine-like drug indicated for treatment of asthma. It is a muscarinic receptor antagonist. Inhibition of this receptor will lead to dilation of bronchial smooth muscles. Dryness of mouth, urinary retention, constipation, and blurred vision are reported side effects of the drug. The recommended dose of the drug is 2 puffs b.i.d.

275 (b) Potassium loss generally causes metabolic alkalosis. HCTZ is reported to cause hypokalemia and therefore more likely to cause metabolic alkalosis.

Generally, acid base disorder is simply classified in to four groups.

- 1 Metabolic Acidosis
- 2 Metabolic Alkalosis
- 3 Respiratory Acidosis
- 4 Respiratory Alkalosis

Metabolic Acidosis

Definition: Generally occurs due to loss of bicarbonate from the body, or an increase in the various endogenous production in the body. It stimulates the respiratory center to increase excretion of CO_2 from the body.

* Metabolic acidosis is further classified as:

A Metabolic acidosis with normal anion gap

B Metabolic acidosis with elevated anion gap

* Metabolic acidosis with normal anion gap occurs due to a loss of bicarbonate from body such as Hypokalemia

* Metabolic acidosis with elevated anion gap occurs due to overproduction of organic acid such as over production of lactic or formic acid. Correct the cause of Metabolic acidosis and if needed use I.V. bicarbonate to elevate arterial pH.

Metabolic Alkalosis

Definition: It is simply defined as an increase in bicarbonate concentration.

It is further classified as a saline-responsive or a saline-unresponsive Metabolic alkalosis.

Metabolic alkalosis occurs due to:

Diuretic therapy
Vomiting
High concentration of alkali administration
Hypercalcemia

As a compensatory phenomena, the excretion of CO_2 will decrease and arterial CO_2 tension will increase. Correct the fluid and electrolyte imbalance first and if needed administer HCl acid or its precursor such as Arginine hydrochloride or Ammonium chloride.

Respiratory Acidosis

Definition: It occurs due to inadequate ventilation of CO_2 by the lungs.
It occurs due to:

Asthma
Beta blockers
Sleep apnea
Use of CNS depressants
Pulmonary edema or embolism
Cardiac arrest

Try to correct the respiratory problem and if needed use Bronchodilator and Doxapram.

Respiratory Alkalosis

Definition: It is generally associated with increase in excretion of CO_2 .

Respiratory alkalosis is not a severe condition.

276 (d) Histamine(H_1), Dopamine (D2) and Serotonin (5HT3) receptors are associated with nausea and vomiting.

277 (b) $X^2 + Y^2 = 1$ would be graphed as a circle. The lists of equations and their graphs is as follows:

Equations

Graph

$$ax^2+by^2+cx+dy+e=0$$

Eclipsed

$$ax^2+bx+c = y$$

Parabola

$$y = mx + c$$

Straight line

$$x^3+bx^2+cx+d = y$$

Hyperbola

278 (c) When a reaction in second order contains a high concentration of one of the reactants (OH^- in our case), the rate of reaction generally depends on only one reactant and reaction will be known as pseudo first order.

279 (b) -3

$$\begin{aligned} y &= 1 - x^2 \text{ where } \lim_{x \rightarrow 2} \\ &= 1 - 4 \\ &= -3 \end{aligned}$$

280 (d) All. The oxidation of pharmaceutical products can be prevented by including antioxidants (negative catalyst) in the formulation. These agents will prevent the oxidation reaction of various pharmaceutical products.

281 (b) Zocor (Simvastatin) is classified as an HMG-CoA reductase inhibitor. It is indicated for the treatment of elevated cholesterol levels in patients with a high risk of atherosclerosis. Rhabdomyolysis with renal functions dysfunction, arthralgia, diarrhea, nausea, and vomiting are reported side effects of the drug. The recommended dose of the drug is 5 to 10 mg once daily in the evening.

282 (b) T cells and B cells are primary response cells of the body against antigens. T cells enter into the thymus gland to mature. Once mature, they are released into the blood circulation via virgin T cells.

283 (b) Dantrolene is indicated for treatment of spasticity associated with Multiple sclerosis. It acts directly on the skeletal muscles and interferes with intracellular calcium movement. This will lead to a reduction in contractions and excitation of muscles. The recommended daily dose would be 100 mg bid or qid. Seizure is a frequently reported adverse effect of the drug.

Baclofen is a second choice of drug to treat spasticity associated with Multiple sclerosis. It hyperpolarizes fibers to reduce impulse transmission. It appears to reduce transmission from the spinal cord to skeletal muscles. The therapeutically recommended dose of drug would be 20 mg three times a day.

284 (b) Diphtheria is an example of a killed inactivated vaccine. Measles, Mumps and Rubella are examples of live attenuated (live organism with reduced disease producing capacity) vaccines. Live attenuated vaccines should never be administered to an AIDS patient.

285 (c) Acid Test ratio is a useful tool to find out the liquidity of a pharmacy. It is also known by (Quick) test ratio. Therapeutically, the ratio of a successful pharmacy would be 1:1. It can be calculated by dividing the sum of cash and accounts receivable by the current liabilities (includes accounts payable, notes payable within 1 year and accrued expenses).

The ratios that indicate the Liquidity and Solvency of a pharmacy are as follows:

- I The current ratios
- II Inventory to Net working capital
- III Acid test ratio

The current ratio (CA:CL): It can be obtained by dividing current assets (include cash, accounts receivable, inventory and prepaid expenses) by current liabilities. The minimum standard value of this ratio would be 2.

Inventory to Net working capital (IN:NWC): This ratio can be calculated by dividing mean inventory (average of the beginning and ending inventory) by net working capital (unencumbered portion of current assets). The high value of this ratio indicates low liquidity, excess inventory and lower sale of goods and vice versa. The normal value of this ratio lies between 80 and 100%.

Ratios indicating profitability:

- I Net profit to Net sales(NP:NS)
- II Net profit to Net worth (NP:NW)
- III Net profit to Total assets (NP:TA)
- IV Net profit to Inventory (NP:IN)

Net profit to Net sales: This can be computed by dividing Net profit by Net sales. It is expressed as a percentage. The ratio of 5 or greater would be an indication of good pharmacy business.

Net profit to Net worth: It can be calculated by dividing Net profit by Net worth. It is the best ratio to find out profitability of a pharmacy since it compares net profit verses net investment. The value of 20 (expressed in %) would be considered a target value for pharmacies; however, for a new pharmacy a value of 40 or for old pharmacies a value of 15% would be acceptable.

Net profit to Total assets: It can be calculated by dividing net profit by total assets. It is generally useful for new pharmacies. The normal value should lie between 10 to 20%.

Net profit to Inventory: This can be calculated by dividing Net profit by inventory. It is a good indicator of profitability as well as efficiency of pharmacies.

Ratios indicating efficiency of a pharmacy:

- I Inventory turn-over rate(IN TOR)
- II Net sales to inventory (NS:IN)
- III Net sales to net working capital (NS:NWC)
- IV Net sales to net worth (NS:NW)
- V Accounts receivable collection time (A/R CT)
- VI Accounts payable remittance time (A/PRT)

Inventory turnover rate: This can be calculated by dividing the cost of goods sold by the average of beginning and ending inventory. The cost of goods sold can be calculated by adding purchases during the accounting period at the beginning of inventory and then subtracting ending inventory from the resultant sum. The target value for this ratio would be 6 or greater.

Net sales to Inventory: This can be calculated by dividing the net sales by the inventory. The target value for this ratio would be 8 or greater.

Net sales to Net working Capital: It can be calculated by dividing net sales by net working capital (current assets minus current liabilities). It is also known as net working capital turnover. The normal range for this ratio would lie between 4 to 8.

Net sales to Net worth: This can be calculated by dividing Net sales by net worth (total assets minus total liabilities). The target value for this ratio would lie between 3 to 8.

Accounts receivable collection time: This ratio can be calculated by dividing year end accounts receivable by mean credit sales per day. It is a direct measure of efficient credit management. Ideally, accounts receivable time should be limited to 30 days.

Accounts payable remittance time: This can be calculated by year end accounts payable divided by mean purchases per day. Ideally, all the accounts payable should be remitted within 21 days from the purchase.

Ratio indicating the financial position of a pharmacy:

- I Total liabilities to Net worth (TL:NW)
- II Funded debt to Net working capital (FD:NWC)
- III Fixed assets to net worth (FA:NW)

Total liabilities to Net worth: This can be calculated by dividing total liabilities by net worth. It is expressed as a %. The ratio of 50 or below would be considered a target value. It is the most direct measure of the financial position of a pharmacy.

Funded debt to Net working capital: This can be calculated by dividing long-term liabilities liabilities older than 1 year, also known as funded debt)

by net working capital. Target value lies between 20 to 25%. The low value indicates that the pharmacy is doing well and can borrow money from financing companies to improve business. The most important thing about borrowing money to improve business is that the new revenue must exceed the cost of capital expenditure (mainly interest paid for capital). This practice is known as Capital leverage.

Fixed asset to Net worth (FA:NW): It can be obtained by dividing fixed assets by net worth. The high value indicates overinvestment in fixed assets and a lower value indicates time to remodel the business. Target value must be 20% or less.

286 (b) Working capital is expressed by the difference between current assets and current liability of the pharmacy.

287 (c) Exotoxin is a product of metabolism produced by gram +ve bacteria. It is water soluble and passes through the surrounding cell. It is thermolabile in nature and can be destroyed at a temperature over 60°C. It is a high molecular weight protein and extremely toxic in nature compared to endotoxin such as toxins produced by *C.botulinum*.

Endotoxin is a structural element of gram -ve bacteria. It is more toxic than exotoxin. It does not extract in surrounding media, and generally liberates the cell lysis. It is a complex structure made up of phospholipid, polysaccharides and protein examples are *V.cholera* and *S. typhi*.

288 (d) All. Health brief model is used to study patient behavior about illness, how to prevent health problems and sick role recommendations such as how to take drugs properly or stick to proper diet.

289 (d) The chances of noncompliance (not following proper regimen of therapy) are

greater with patients older than 60 years those who do not have any proper education about the drug or do not know the importance of the drug. The price of the drug can also be one of the factors.

290 (a) A placebo is defined as a medication that is ineffective but may help to relieve a condition because the patient has faith in its power. In Latin, placebo means "I shall please". It generally helps to differentiate the pharmacological effects of a drug from the psychological factors. It also helps to evaluate new drug effectiveness. The evaluation of placebos can be done by double blind study (a study in which neither patient nor physician know about the drugs). In a single blind study the physician is aware of the drug. Double blind study is more accurate compare to single blind study, since patient's as well as physician's psychological and emotional factors do not affect the study.

291 (a) Lysosome is known as the digestive organ of a cell. It helps in removal of damage cells from the body. It contains lysozymes that may kill the bacteria before it damages the cell, thus it serves as an immune system for the bacterial cell.

292 (b) Bacteria do not have any mitochondria; their cytoplasmic membrane is a site of oxidative and phosphorylative enzymes.

293 (c) Lysosomes are extremely small organelles made by the Golgi apparatus. They contain digestive enzymes that help in digestion of starch, glycogen and fat. They fuse with vacuoles (cells that store glycogen, starch and fat) and release digestive enzymes into vacuoles.

294 (b) Proxemic (distance between two interacting persons) is a powerful nonverbal communication. Effective listening, kinetic, gesture, eye reflection and facial expression are examples of nonverbal communication.

295 (c) Oxygen transport capacity is a rate limiting step in synthesis of RBC. Pre-erythrocyte is the first step in synthesis of RBC series. 1 gram of pure hemoglobin has 1.39 cc of O₂ carrying capacity. As the tissue oxygen supply decreases, the production of RBC increases. Erythropoietin, a glycoprotein, is a key hormone for production RBC. In absence of erythropoietin, hypoxia is unable to stimulate the production of RBC. The kidney is a principal organ for synthesis of erythropoietin, therefore kidney failure would result in severe anemia. The normal value RBC in adult men would be 5.2 million and in women would be 4.7 million. The spleen, bone marrow and kupfer cells are important sites for RBC destruction.

296 (b) Intrinsic factor also known as glycoprotein helps in absorption of vitamin B12. The minimum amount of vitamin B12 required daily would be 1 to 3 micrograms. The body can normally store 1000 times more. The deficiency of vitamin B12 may cause pernicious anemia. Deficiency of folic acid and vitamin B12 generally causes megaloblastic anemia (RBC can carry oxygen, but has very short half life).

297 (b) Green vegetables, fruits and liver are good sources of folic acid.

298 (c) The normal life span of RBC is 120 days.

299 (d) All. Iron is absorbed from the small intestine. It combines with beta globulin before it is absorbed through the small intestine. Reticuloendothelial cells, liver hepatocytes and apoferritin are storage sites for iron. In normal adults, men will lose 1 mg of iron per day and women will lose 2 mg of iron per day. Apotransferrin (secreted by the livers) combines with iron in the small intestine and forms transferritin. The deficiency of iron may cause anemia.

300 (b) The lack of formation of bone marrow will result in aplastic anemia. Certain drugs such as Chloramphenicol have the tendency to adversely affect the bone marrow and may cause aplastic anemia.

Sickle cell anemia is a genetic disorder in which amino acid valine is substituted for glutamic acid in the beta chain of hemoglobin. When such hemoglobin is exposed to oxygen, it forms an enlarge structure inside the cell which makes it impossible to pass through the capillary and may result in the rupturing of RBC cells.

301 (b) Polycythemia vera is defined as an abnormal increase in the quantities of RBC. Tumors of the organ that produce RBC may be responsible for this. Viscosity of blood increases three times more than normal. A person becomes bluish.

302 (b) S. Viridan is found in normal flora of the human respiratory tract. It generally causes subacute bacterial endocarditis. It is classified as gram +ve cocci. Streptococci exist in a number of different species. These species can be differentiated by hemolysis. A group of streptococci such as S.pyrogen that causes complete hemolysis of a cell is known as beta hemolysis. They generally produce strep throat, scarlet fever and rheumatic fever.

A group of streptococci that causes incomplete hydrolysis is known as alpha hemolysis. An example is S. viridans. This strain generally causes infection of heart valves and the lining of the heart.

Staphylococcus aureus is classified as gram +ve micrococci. It is a common human pathogen responsible for causing skin abscesses and boils. S. epidermis normally causes opportunistic infections.

303 (d) All generally cause meningitis. *Neisseria meningitis* is classified as aerobic gram negative rods and cocci. It is responsible for causing meningitis (an inflammation of the membrane that covers the brain).

Haemophilus influenza is another organism responsible for causing meningitis. More than two-thirds of meningitis is caused by this organism. It occurs in first year of life, and the body rapidly acquires immunity against it. Therefore pneumonia caused by this organism is rare in adults.

Streptococcus pneumonia and *E.coli* are also causative organisms for meningitis, however *E.coli* generally causes meningitis in new born infants (0 to 2 months).

304 (b) 80% or more of bone infections are caused by *Staphylococcus aureus*. It is the most pathogenic organism of the staphylococci group. Skin infections caused by this organism are very common since they are always present on the skin.

Clostridium difficile is the most common anaerobic organism. It is associated with antibiotic induced colitis. Vancomycin is the drug of choice for treatment of colitis.

305 (c) The origin or occurrence of the lyme disease is the bite of ticks. The bite of ticks is usually painless. It can be identified by the presence of an annular skin lesion found on the thighs and buttocks. The disease is usually associated with neurological and CVS complications.

306 (b) *E.coli* is the causative agent for 80% of urinary tract infections. *Proteus mirabilis* is an other organism that can cause UTI. *P.aeruginosa* is also the most common pathogen for causing UTI and wounds and burn infections. Bactrim and Septra (SMZ/TMP), Noroxin (Norfloxacin) and Cipro (Ciprofloxacin) are common drugs indicated for treatment of UTI.

307 (b) The major biotransformation site of a drug in humans is the liver.

308 (c) Phenobarbital is a weak acid. Administration of Sodium Bicarbonate will increase the ionization of Phenobarbital and reduce its reabsorption from renal tubules.

309 (b) *T.pallidum* causes syphilis. It is classified as a sexually transmitted disease. It can be treated by penicillin, although tetracycline and erythromycin are also effective.

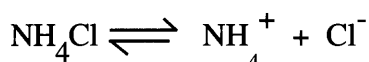
310 (b) *Salmonella* and *E.coli* are present in a normal flora in the guts.

311 (d) All. The solubility of a substance is affected by temperature, pH and by common ion effects.

Temperature: The dissolution of a solid in a liquid generally involves the absorption of heat such as the Endothermic process with positive heat of dissolution. If this type of system is heated, then according to Le Chatelier's principal, reaction will move (right to left) in a direction that makes the system loose the heat. Therefore, the dissolution of the solid will increase (since dissolution of the solid the associate with absorption of heat). The opposite is also true, if dissolution of the solid liberates the heat instead of absorbs it. If this type of system is heated then the reaction will move from left to right and the solubility of substance will decrease.

pH: pH plays an important role in solubility of substances such as a weakly acidic drug is more soluble in alkaline media due to ionization of a drug and vice versa.

Common ion effects: The solubility of sparingly soluble electrolytes generally reduces by the addition of a second electrolyte that possess is a similar ion to the first.



If we add NaCl from the outside it will increase the concentration of free chloride ions. According to the Le Chatelier principal system will move in a direction that may help to nullify the effect of this extra chloride ions, therefore system will move from right to left and will result in a decrease in solubility of NH_4Cl .

312 (c) In a phase diagram, when three phases exist in equilibrium with one another it is known as Triple point.

313 (b) When a substance tends to loose water vapor to establish an equilibrium with the surrounding atmosphere and form an anhydrous salt, it is defined as the process of efflorescence.

Evolution of gas when dissolving a substance into water is known as effervescent. The addition of sodium bicarbonate in a citric acid solution is an example.

When a substance tends to absorb the water vapor from the surrounding atmosphere, and forms more hydrated salt, it is defined as the process of hygroscopicity. The term deliquescence is applied if a hydrated substance converts to a liquid form.

314 (b) Silica is a commonly employed desiccant in pharmaceutical product to prevent products deterioration by moistures and water vapors. It has a powerful water vapor absorbing capacity.

315 (b) The minimum concentration at which physical properties of a solution of association colloids such as osmotic pressure and electrical conductance show marked changes is known as CMC (Critical Micelle Concentration).

316 (d) All the mentioned are examples of Xerogel. Many gels shrink when the fluid component is removed from the gel, such as by evaporation or freeze drying. When the remaining solid

comes in contact with fresh fluid, it will swell and reform the gel again. This type of the gel is known as Xerogel.

317 (b) Conductance is not a physical property of gels. The other choices such as swelling, syneresis (gels will often contract spontaneously and remove some of the fluid medium which is known as syneresis) and aging are physical properties of the gels.

318 (c) A half life equation for zero-order kinetic is $t_{1/2} = a / 2K$:

$t_{1/2}$	=	Half life
K	=	Rate constant
a	=	Initial concentration of drug

319 (c) The accelerated stability testing of pharmaceuticals generally requires tests on effects of temperature, humidity and light on pharmaceutical products.

As the temperature increases, the rate of reaction will also increase. A product may deteriorate easily in the presence of high humidity or sunlight. These will cause the degradation of pharmaceutical products. To find out the stability of pharmaceutical products in, the presence of light, moisture and temperature, the pharmaceutical products are stored at elevated temperatures, in an atmosphere that contains high humidity, and in the presence of a high source of artificial light. The results of such testing are then plotted on a graph to find out the stability of various pharmaceutical products.

320 (c) Gram stain generally divides bacteria into gram +ve and gram -ve. The bacteria are first stained with a crystal violet and then treated with iodine solution which fixes a stain to the cell. This stain is then washed with alcohol. The bacteria that retains the stain (after washing with alcohol) are classified as gram +ve and those that do not retain the stain are classified as gram -ve.

Acid fast stains are generally employed for mycobacteria, due to high lipid contents of these bacteria that cannot stain, with normal stains i.e. M. leprae and M. tuberculosis. In this method, bacteria are first stained with hot concentrated carbol-fuchsin solution, washed with water and then treated with 25 % sulfuric acid followed by 98 % alcohol.

Phenol coefficient tests and Chick Martin tests are indicated to evaluate the disinfectants.

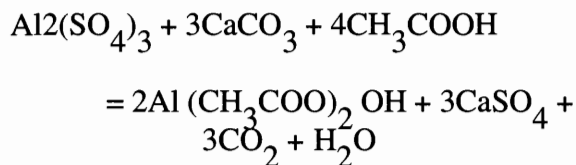
321 (b) Mantoux tests and Tuberculin PPD tests are indicated to identify a person's immunity against tuberculosis. Schick test is employed to find out the immunity of a person against diphtheria.

322 (b) The storage of collected blood should be done between 4° to 6° C.

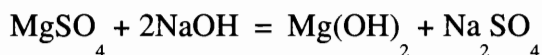
323 (a) Chlormerodrin isotope is indicated to localize brain tumors. Below is the list of various isotopes and their uses.

Name	Indication/diagnosis
Ferric citrate	For iron metabolism
Gold	Malignant effusions
Sodium hippurate	Renography
Sodium phosphate	Polycythemia vera Leukemia
Cyanocobalamin	For Vit B ₁₂ metabolism
Sodium Iodide	Thyroid cancer
Iodinated serum albumin	To determine plasma and blood volume

324 (b) 2



325 (a) 2



326 (d) All. Protein binding makes drugs inactive. It serves as a storage for drugs. It delays the metabolism and excretion of a drug.

327 (d) Pregnancy, uremia and hypoalbuminemia affects the protein binding of drugs.

328 (b) Prodrugs are drugs that become active after metabolism. Normally biotransformation makes a drug inactive but in case of prodrugs they become active after biotransformation. Levodopa (inactive) is a prodrug of Dopamine, the former one enters into the brain and become active (to dopamine).

Prodrug is generally used to obtain better tolerance of a drug (side effect point of view), better absorption of a drug and to improve distribution of a drug compared to its parent compound.

329 (b) The major metabolic product of Sulfanilamide in humans is p hydroxy benzene sulfonamide.

330 (b) The metabolic product of norepinephrine is mandelic acid. It is metabolized by MAO (Monoamine Oxidase enzyme) and COMT (Catechol O-Methyl Transferase).

331 (d) All. Probenecid, Penicillin and Chlorothiazide are secreted by renal tubular secretion.

332 (d) The half life of the drug is affected by the patient's renal and liver function, age, con-

current disease conditions, pH of the urine, simultaneous administration of enzyme inhibitor or enzyme inducer drugs. It is defined as the time required to get half (50%) of the drug's initial concentration. It is a very important tool used to estimate the dosing frequency of new drugs, loading dose of a drug, route of administration and volume of distribution of drugs.

333 (d) All the mentioned choices are employed to evaluate bioequivalency of drugs.

334 (b) The type of study where the nature of a drug is concealed from the patient as well as the attending physician is known as a double blind study.

335 (a) The synthesis of acetylcholine occurs in nerve fibers by combination of acetyl with choline in presence of CAT (Choline Acetyl Transferase). Synthesized acetylcholine is generally stored in synaptic vesicles.

336 (c) Cholinergic drugs are indicated for the treatment of glaucoma, atony of bladder and for the treatment of M. gravis. It is not indicated for treatment of asthma. Anticholinergic drugs (Ipratropium) are employed in treatment of asthma.

337 (b) Normally, Alpha-2 receptor stimulation prevents the release of noradrenaline.

Below is the summary of the function of various receptors:

Alpha-1: Constriction of blood vessels that supply to skin and mucosa. Therefore Alpha-1 blockers (prazosin, doxazosin, terazosin) are good vasodilators.

Alpha-2: Prevents the release of noradrenaline. Thus stimulation of this receptor helps in controlling hypertension by preventing release of noradrenaline, i.e. clonidine, methyl dopa etc.

Beta-1: Generally found in the heart. It is excitatory in nature. Stimulation of this receptor is useful in cardiogenic shock, i.e digoxin, dopamine etc.

Beta-2: Stimulation of this receptor produces relaxation of smooth muscles and blood vessels that supply to skeletal muscles. Therefore most Beta-2 agonist drugs (albuterol, metaproterenol, bialterol etc.) are indicated for treatment of asthma.

338 (d) All. Prazosin, Terazosin and Doxazosin are alfa-1 receptor blockers. They are indicated for treatment of hypertension and BPH. The first dose syncope is generally related with these type of drugs.

339 (d) All. Heavy smokers are more likely to have chronic bronchitis, emphysema and peripheral vascular disease.

340 (b) Physostigmine and Neostigmine are inhibitors of cholinesterase enzymes (enzyme that metabolize acetylcholine). These drug are indicated for the treatment of M. gravis and glaucoma. Neostigmine is also indicated for treatment of atropine poisoning. Carbachol and Bethanechol are classified as choline-esters indicated for the treatment of glaucoma and atony of bladder.

341 (b) Homatropine, Atropine, Hyoscine, Scopolamine, Benztropine, Trihexylphenidyl, Biperiden, Ipratropium and Procyclidine are parasympatholytic (acetylcholine antagonists) agents. They are indicated for treatment of Parkinsonism, asthma and for the dilation of pupils.

342 (b) Physostigmine is useful for treatment of acute atropine poisoning.

343 (d) All. Succinylcholine, d-tubocurarine, dantrolene are useful for muscle spasm and rigidity of skeletal muscles.

344 (b) Thiopental Na is a useful anesthetic agent for producing short term anesthesia.

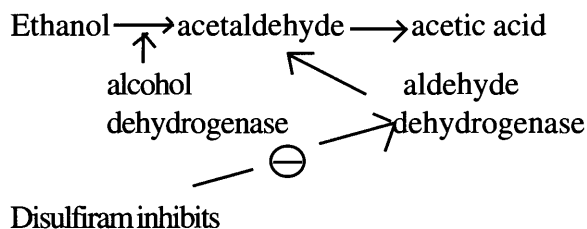
345 (c) Chloride ion is associated with GABA receptors to produce tranquillizing effects. Most of the benzodiazepine class of drugs generally produce tranquillizing effects by stimulating these receptors. GABA (Gama Amino Butyric Acid) is classified as an inhibitory neurotransmitter.

346 (b) The % of alcohol generally found in wine is between 10 to 20%. Below is a list of products and their alcoholic contents.

Name of drink	% alcohol
Beer	4 to 6%
Wine	10 to 20%
Rum, whisky, vodka	40 to 60%
Brandy	60 to 70%

347 (b) The antidote for Methanol (lattho in desi language) is ethanol. The alcohol dehydrogenase oxidized the methanol to formaldehyde, which then oxidized to formic acid by aldehyde dehydrogenase. The formation of formic acid is very toxic to the human body and may be responsible for blindness. By administering ethanols, which has a high affinity for aldehyde dehydrogenase, one can stop the formation of formic acid and subsequently side effects related to it.

348 (c) Disulfiram (Antabuse) is a useful drug for the treatment of alcohol addiction. It inhibits the enzyme aldehyde dehydrogenase that is responsible for converting acetaldehyde into acetic acid. Accumulation of acetaldehyde in the body produces flushing of skin, palpitation with throbbing headache, low blood pressure, and nausea and vomiting. These will make the patient want to quit drinking the alcohol.



349 (b) Quinidine is a class 1A antiarrhythmic agent.

Class IA : Quinidine, Disopyramide, Procainamide

Class IB : Phenytoin, Lidocaine, Tocainide, Mexiletin

Class IC : Flecainide, Encainide

Class II : Beta blockers

Class III : Sotalol

Class IV : Calcium channel blockers

350 (d) Hyperaldosteronism, pheochromocytoma and cushing's syndrome are disorders responsible for causing secondary hypertension.

351 (d) All. High salt intake, hyperlipidemia, and obesity may increase the chances of essential hypertension.

352 (b) Alpha-methyl noradrenalin acts as a false neurotransmitter (for noradrenalin). It stimulates the alpha-2 receptors that will prevent the release of noradrenalin.

353 (d) All. Most of the alpha-2 receptor agonists, i.e. methyl dopa, clonidine and reserpine, may induce depression and should be carefully prescribed in patients with a past history of depression.

354 (b) Angiotensin II has a powerful vasoconstriction property. It forms from Angio-

tensin I by the action of Angiotensin converting enzyme. ACE inhibitors generally inhibit this enzyme activity and help controlling hypertension.

355 (c) Tachycardia and edema are the most common adverse effects reported with the use of vasodilators, therefore it is preferred to use beta blockers and diuretic therapy with vasodilators. Palpitation and weight gain (primary due to edema) have also been frequently reported.

356 (a) Minipress (Prazosin) is classified as a vasodilator. It is an alpha-1 receptor blocker. It is indicated for the treatment of essential hypertension. The recommended dose of the drug is 1 to 2 mg by mouth at bed time. Severe hypotension including first dose syncope, tachycardia, and edema are reported side effects of the drug.

357 (c) Nitrite (Sodium nitrite) is a useful drug in treatment of cyanide poisoning. Cyanide ion forms complex with irons. Nitrite ions react with hemoglobin and produce methemoglobin, which has a low affinity for oxygen and a high affinity for cyanide ions. Thus formation of methemoglobin reacts with Iron-CN complex and releases the iron. The resultant complex (cyanomethemoglobin) further detoxifies by administration of sodium thiosulfate.

Iron CN \longrightarrow Methemoglobin CN + Iron
+
Methemoglobin

358. (d) The salt of strong acid with weak base may produce an acidic solution when dissolved in water.

359 (d) All. Astemizole, Cetirizine, Loratadine and Terfenadine are non-sedative antihistamines. They produce less sedation or no sedation compared to other available antihistamines.

360 (b) Growth hormone and Thyrotropic hormone are secreted through anterior pituitary glands. Oxytocin is secreted through posterior pituitary gland. Below is the summary of glands and their secretions.

<u>Glands</u>	<u>Hormone secretions</u>
Anterior Pituitary	Luteinizing hormone (LH) Adrenocorticotrophic hormone (ACTH) Follicle stimulating hormone (FSH) Thyrotropic hormone (TSH) Prolactin Growth hormone
Intermediate	Melanocyte stimulating hormone (MSH)
Posterior pituitary	Oxytocin Vasopressin
Pancreas	Insulin Glucagon Somatostatin
Thyroid	Thyroxin (T_4) Triiodothyronine (T_3) Calcitonin
Parathyroid	Parathormone
Testis	Testosterone
Ovary	Estrogen Progesterone
Adrenal	Glucocorticoids Mineralocorticoids Sex steroids

361 (b) The function of the anterior pituitary gland is controlled by the hypothalamus, although the pituitary gland controls the other endocrine glands.

362 (b) Generally, any fall in thyroid hormone in blood stimulates the hypothalamus to secrete the respecting release factor, Thyrotropic releasing factor (TRF). This factor will then stimulate the pituitary gland to secrete specific stimulating hormone such as TSH (Thyroid Stimulating Hormone). The stimulating hormone will then stimulate the particular gland (Thyroid) to release the specific hormone. The whole process of stimulating the particular endocrine gland in response to a reduce in blood level of a particular hormone is known as Positive Feed Back Mechanism. To stop the secretion of a particular hormone in blood, the body uses the Negative Feed Back mechanism.

363 (b) The hypersecretion of growth hormone in young patients generally causes Gigantism. In adults, it will cause Acromegaly. The hyposecretion of growth hormone in adults causes Acromicria and in the young causes Dwarfism.

364 (b) Prolactin is responsible for lactation in the post partum state of women. Growth hormone generally helps in initiating milk secretions. It is also responsible for development of mammary glands during pregnancy.

Oxytocin is a posterior pituitary hormone. It induces labor and uterine contractions in pregnant women. It is also used to control post partum hemorrhage.

Vasopressin is another important hormone secreted by the posterior pituitary. It is very important hormone in regards to its action on the kidney. It also has a powerful vasoconstriction property. Its action is mediated through V1 and V2 receptors. The antidiuretic effect of this hormone is generally mediated through its V2 recep-

tors. Therefore, Desmopressin (Specific to V2 receptor) an analog of vasopressin, is used to treat diabetes insipidus.

Calcitonin is the hormone secreted through the thyroid gland. The principal action of calcitonin is to reduce the plasma calcium concentration by its effects on the kidney and bones. It reduces the reabsorption of calcium in the proximal tubules of the kidney and increases the osteoblast activity in a bone.

Parathyroid hormones act the opposite of calcitonin. They increase the plasma concentration of calcium by mobilizing it from bone to blood and by decreasing excretion of it through the kidney.

365 (d) Tetraiodothyronine takes an active part in the function of the thyroid gland.

366 (d) The hyposecretion of the thyroid hormone causes myxedema, goitre and cretinism. Grave's disease results due to hypersecretion of the thyroid hormone.

Myxedema: In this disease, the patient may have slow speech, a puffy face, slow pulse, low BMR and scanty hair.

Cretinism: The growth and height of the child is stunted. The patient has low BMR and a bloated face. The patient is also mentally retarded.

Goitre: It is also known as simple or non-toxic goitre. A dietary deficiency of iodine may be responsible for this. The neck of the patient is swollen.

The hypersecretion of the thyroid hormone may cause thyrotoxicosis or Grave's disease. The Hyperthyroidism normally is divided in to two categories: Grave's disease or diffuse toxic goitre and Toxic nodular goitre.

Diffuse toxic goitre: It is an organ specific autoimmune disorder in which antibodies produced against autoantigens stimulate the secretion of the thyroid hormone. It may cause protrusion of the eyeballs. Hasimoto's disease is completely opposite, as the resultant antibodies due to autoantigens inhibit the secretion of the thyroid hormone.

Toxic nodular goitre: It is due to benign neoplasm or adenoma or may be because of long standing normal goitre.

367 (b) Below are the common signs and symptoms of associated hyperthyroidism.

- * Fast heartbeat
- * Weight loss
- * Starring eyes
- * High BMR
- * Sharp and anxious mind

368 (b) Parathyroid hormone generally regulates the mobilization of calcium between bone and blood. It stimulates the transfer of calcium from bone into blood.

369 (b) Diabetes mellitus is a common complication that occurs due to partial or complete absence of secretion of endogenous hormone insulin. It can be classified into two categories.

- I Insulin dependent diabetes or Juvenile onset diabetes
- II Insulin non-dependent diabetes or Maturity onset diabetes.

Insulin dependent diabetes: It generally occurs in young patients. Secretion of insulin generally stops. Patient may depend on exogenous supply of insulin. Diabetic ketoacidosis and coma are major complications of therapy. The onset of disease is very fast.

Insulin non-dependent diabetes: It usually is reported with patients age greater than 40. The poor secretion of insulin from functioning B-cells is responsible for it. The complication of diabetic ketoacidosis and coma are less severe. Patient may respond to sulfonylurea.

Cataract, renal failure, cardiovascular disease and peripheral neuropathy are common complications associated with diabetes.

370 (b) Emphysema is not a long-term complication associated with diabetes. Cataracts, renal failure and peripheral neuropathy are commonly reported complications of diabetes.

371 (b) A normal pancreas secretes 50 units of insulin per day.

372 (b) The synthesis of glucose from non-carbohydrate sources is defined as gluconeogenesis.

373 (b) Sulfonylurea stimulates the release of insulin from the pancreas by stimulating the beta-cells of islets of langerhans. They are indicated for the treatment of diabetes. Hypoglycemia is common side effect reported with sulfonylureas.

374 (a) Cholesterol is a major precursor of steroid hormone.

375 (b) Cortisol, Cortisone and Corticosterone are naturally occurring corticosteroids. Prednisone, Dexamethasone and Triamcinolone are synthetic corticosteroidal agents.

376 (c) Each sodium ion holds the molecule of water which in turn increases the blood volume of a patient and may increase the risk of hypertension.

377 (a) Retrospective utilization review is performed after the patient receives a drug. The

study of a particular drug after the common adverse effects reported by number of patients is such a review. In this review method, there is no scope to modify the patient's therapy (since the event has occurred).

Prospective utilization review is generally carried out before the patient receives the drug. Such as checking a patient's profile before the patient receives the drug.

Concurrent utilization review is carried out at the time when the patient is receiving the drug.

378 (b) Nolvadex (Tamoxifen) is an estrogen receptor antagonist indicated for treatment of breast cancer. Pulmonary embolism, thromboembolic order, hepatic necrosis, nausea, vomiting, and diarrhea are reported side effects of the drug. The recommended dose of the drug is 10 to 20 mg b.i.d.

379 (b) Carrots are a good source of vitamin-A.

380 (c) Bleeding from the gums, hemorrhage and retarded healing are important signs of scurvy. Defective bones and teeth are generally reported with osteomalacia and rickets due to a deficiency of Vitamin D.

381 (b) The deficiency of thiamine generally causes the disease Beri-Beri. The patient's weight and appetite generally decreases and the patient gets easily tired. Neuritis may occur.

382 (c) The deficiency of Vitamin B₁₂ generally causes pernicious anemia.

383 (b) Green vegetables, liver, curd and pulses are good sources of folic acid.

384 (c) Abnormal destruction of RBC is generally classified as hemolytic anemia.

385 (a) Deficiency of Iron normally causes hypochromic anemia. Hyperchromic anemia is normally reported with a deficiency of folic acid and vitamin B12.

386 (c) Ferrous fumarate contains a high amount of elementary iron (33%). Below is the list of iron salts and their iron contents.

Ferrous sulfate	20%
Dried ferrous sulfate	30%
Ferrous gluconate	12%
Ferrous fumarate	33%

387 (b) Net profit to net worth ratio is the best indicator of a pharmacy's profitability, because it compares the net profit to net investment in the pharmacy.

388 (b) Inventory turnover rate generally describes the efficiency of a pharmacy. It is generally calculated by dividing the cost of the goods sold by the average of beginning and ending inventory.

389 (c) An acid test generally measures the liquidity of the pharmacy. It can be calculated by dividing the sum of cash and accounts receivable by the current liabilities.

390 (d) The acceptable ratio of Net profit to net sales generally lies between 5 to 7%.

391 (c) The acceptable Net profit to net worth ratio for a 10 year old pharmacy would be 15%. The target value for this ratio would be 20%. A 40% figure can be achieved in a new pharmacy.

392 (d) All. This ratio is calculated by dividing profit by inventory. It is a good indicator of profitability as well as efficiency. It can be used for new and old pharmacies. It increases with an increase in sales of a pharmacy.

393 (a) The normal target value for net profit to total asset ratio is between 10 to 20%. Manan Pharmacy's net profit to total asset ratio is 15%, so it would be considered good.

394 (b) The inventory turnover rate can be calculated by dividing cost of goods sold by the average of beginning and ending inventory.

$$\begin{array}{rcl} \text{Cost of goods sold} & = & \$ 5,00,000 \\ \text{Beginning inventory} & = & 2,00,000 \\ \text{Ending inventory} & = & 2,20,000 \end{array}$$

$$\begin{aligned} \text{IN TOR} &= \frac{\text{cost of goods sold}}{\frac{\text{beg inv} + \text{end inv}}{2}} \\ &= \frac{5,00,000}{\frac{200,000 + 220,000}{2}} \\ &= 2.38 \end{aligned}$$

The inventory turnover rate should be a minimum of 4 with a target of 6 or higher. Manan Pharmacy's turnover rate is below expectations.

395 (b)

396 (b) The ratio of net sales to inventory can be calculated as :

$$\begin{aligned} &= \frac{740,000}{210,000} \\ &= 4 \end{aligned}$$

397 (b) Net worth can be calculated by subtracting total liabilities from total assets.

$$\begin{aligned} \text{Net worth} &= \text{Total assets} - \text{total liabilities} \\ &= 190,000 - 75,000 \\ &= 1,15,000 \end{aligned}$$

398 (a)

399 (a) Class I type of recalls should be considered a potential hazard to health. The product in question may cause temporary or medically reversible adverse health consequences should be classified as a class II type recall. The product in question is not likely to cause any adverse health consequences should be classified as a class III type of recall.

400 (c) Category X is contraindicated in pregnancy. Below are the categories and their effect on pregnancies.

- | | | |
|---|---|----------------------------------|
| A | = | Controlled studies show no risk. |
| B | = | No evidence of risk in humans. |
| C | = | Risk cannot be ruled out. |
| D | = | Positive evidence of risk. |

401 (b) Liquidity generally expresses a pharmacy's ability to meet its current liabilities.

402 (b) The acid test generally measures a pharmacy's liquidity.

403 (b) Accounts payable are generally not included in current assets. Cash, accounts receivable and inventory are part of current assets.

404 (b) Fixtures and equipment would be considered fixed assets of a pharmacy.

405 (d) Notes payable beyond 1 year are considered Long-term liabilities of the pharmacy. Accounts payable, accrued expenses and notes payable within 1 year are considered current liabilities of the pharmacy.

406 (b) Acid Test ratio can be calculated by dividing the sum of cash and accounts receivable by the current liabilities.

$$\begin{aligned} &= \frac{50,000 + 75,000}{85,000} \\ &= 1.47 \end{aligned}$$

407 (c) Net sales to inventory measures the efficiency of the pharmacy.

$$V = [(80,000 \times 0.4) \times 50] 0.15$$

$$= \$ 240,000$$

408 (b) Below expectation.

The owner of the Manan Care Pharmacy is asking \$ 350,000 for an existing prescription file, therefore the asking price is too high.

$$= \frac{\text{Total liabilities}}{\text{Net worth}}$$

$$= \frac{105,000}{165000} \times 100$$

$$= 63.63\%$$

The target value for Total liabilities to net worth ration would be 50% or less.

409 (c) The investment of Manan Pharmacy in a fixed asset meets requirements. The target value for this ratio would be 20% or below.

$$= \frac{\text{Fixed assets}}{\text{Net worth}} \times 100$$

$$= \frac{35000}{165000} \times 100$$

$$= 21\%$$

410 (b) The price of a prescription file can be calculated by the following equation:

$$V = [(F \times R) P] N \text{ where}$$

$$V = \text{Price of prescription file.}$$

$$F = \text{Total new prescription is dispensed in past two years.}$$

$$R = \text{The \% of prescriptions with one or more refill left.}$$

$$P = \text{The pharmacy's average prescription price.}$$

$$N = \text{Net profit \%}$$

$$\mathbf{411 (a)} \quad E = \frac{Q}{P} \text{ where}$$

E = Coefficient of elasticity

Q = % of sales quantities change

P = % of price change

In our example, the sales quantities of analgesic balm has been changed from 60 to 80 (33% change), and the price of balm has changed from 3 to 2 (33%). Therefore elasticity of coefficient would be :

$$= \frac{33}{33}$$

$$= 1$$

412 (a) When a relative change in revenue is the same as relative change in price, it is known as unitary elasticity.

When the relative change in revenue is less than the relative change in price, it is known as inelastic demand.

If the relative change in revenue is greater than the relative change in price, it is said to be elastic demand.

$$\mathbf{413 (b)} \quad \$16.30$$

$$R = \frac{C}{P}$$

$$R = \text{Retail price of drug}$$

$$C = \text{Cost of drug}$$

$$P = \text{Cost complement in \%}$$

Therefore the retail price of insulin would be

$$= \frac{9.00}{0.55}$$

$$= \$ 16.30$$

Cost complements % + % mark up = 100%

414 (c) 66%

The retail price of a drug is \$75, therefore the mark up on prescriptions would be \$30 (\$ 75 - \$ 45).

For a \$ 45 drug, \$ 30 would be the mark up.

For a \$100 drug ?

$$30 \times 100 / 45 = 66\% \text{ make up}$$

415 (c) \$16.30

MU/C = Known retail mark up
cost of complement

$$= \frac{45}{55} = 0.81 = 81\%$$

R = cost of drug x (100 + MU/C)

$$= 9 \times (181\%)$$

$$= 9 \times 1.81 = \$ 16.30$$

416 (c) \$ 1200

Rx rent = Total rent x space ratio

$$= 10,000 \times 600/5000$$

$$= \$1200$$

417 (b) The funding for Medicare programs is generally obtained from social security tax and premiums paid by the participants.

418 (a) Copayment: It is a patient cost sharing plan in which the patient has to pay a specified amount (normally \$ 10 to \$ 15) of the cost of prescriptions and a third party will pay the remainder.

Coinsurance: It is a part of a patient cost sharing plan in which the patient pays a specified percentage of all the losses incurred.

Deductible: A part of a patient cost sharing plan in which the patient has to pay a fixed amount of the cost (normally \$ 250) within a specific period of time (normally 1 year) before the benefit is paid by third parties. i.e. Total health care cost for Mr.X for year 1999 is \$1500 and his deductible is \$250, then, the third party will only pay benefits after the patient pays \$ 250 out of his pocket.

Capitation: A form of prospective reimbursement in which an institution will pay a fixed amount of money to the service provider pharmacy for each patient. In this type of payment, the pharmacy will only make money when the cost of medications dispensed to the patient is less than the fixed cost provided by the institution.

419 (b) A person who works for an insurance company and provides the statistical data that indicates the risk associated with serving the population, and determines the premiums to cover all the estimated expenses, is known as an actuary.

420 (a) The maximum amount that will be paid by a third party to a pharmacy when the drug is available from more than one source is defined as MAC, or maximum allowable cost

Estimated acquisition cost (EAC): The third party's estimate of the prices paid by a pharmacist for a particular drug product.

Actual acquisition cost (AAC): The actual price paid by a pharmacy after all trade, volume and cash discounts.

Average wholesale price (AWP): The published list price of a particular product.

421 (b) If a patient pays a full predetermined amount to the provider at the beginning of each month is known as Prospective reimbursement.

422 (b) Mean = 588

$$= \frac{350+420+530+600+620+635+700+850}{8}$$
$$= 588$$

423 (c) The median of a sample is the middle value of an experiment. If the sample is even then calculate the average of the middle values, for example in our experiment the middle values are 600 and 620, therefore the median would be :

$$= \frac{600 + 620}{2}$$
$$= 610$$

424 (c) Negatively skewed. The frequency distribution of a sample is calculated by = Mean - Median (Mode)

$$= 130 - 155 = -25$$

If the value of (mean-mode) is negative, the frequency distribution of the sample would be negatively skewed. If the value is positive then the frequency distribution of the sample would be positively skewed.

425 (d) The frequency of distribution can be bell shaped, skewed, U shaped and or J shaped.

426 (c) The Pearsonian coefficient can be calculated by the following formula:

$$3 \frac{(\text{Mean} - \text{Median})}{\text{Standard deviation}}$$

$$= 3 \frac{(55 - 45)}{35}$$
$$= 0.85$$

427 (b) Each trial in a Binomial experiment comes out a success or failure. The repeated trial are independent of previous experiments. The experiments generally consists of "n" repeated trials. The probability of success remains constant from trial to trial.

An example of this is tossing a quarter for "n" times to get heads (tails would be considered a failure) each time.

428 (b) The mean of binomial distribution can be calculated by :

$$\text{Mean} = n \times p$$
$$= 50 \times 0.6$$
$$= 3$$

429 (b) The range of a set can be calculated by the difference between the highest value and the lowest value of the experiment.

$$= 140 - 110$$
$$= 30$$

430 (b) The degree of freedom for a t distribution can be calculated by = n-1 :

$$= 20-1$$
$$= 19.$$

431 (b) The degree of freedom for chi-square test can be calculated by

$$= (R-1) \times (C-1)$$
$$= (2-1) \times (3-1) = 2$$

432 (a) One sided.

433 (b) Amino acids are joined by peptide bonds in proteins.

434 (d) The secondary structure of protein consists of alfa-helix, beta helix and beta-bend.

435 (d) The denaturation of protein can occur in the presence of heat, strong acid or organic solvent.

436 (c) Sickle cell anemia is a genetic disorder resulting from the production of variant hemoglobin. It is characterized by pain, lifelong hemolytic anemia and tissue hypoxia. The replacement of valine at the sixth position of the beta-globulin chain for glutamate is responsible for this. The formation of HbS has extremely low solubility compared to HbA, and results in aggregation of molecules to form or create sickle shaped red blood cells.

437 (b) The enzyme with its cofactor is known as Holoenzyme. Apoenzyme refers to the protein portion of the holoenzyme. Nonprotein cofactors (i.e. Zn^{+2} , Fe^{+2}) required for the activities of certain enzymes are known as Coenzymes.

438 (b) The process in which the release of energy from energy-rich molecules such as glucose and fatty acid occurs in mitochondria is commonly referred to as Oxidative phosphorylation.

439 (b) The breakdown of complex molecules such as protein, lipid and polysaccharide into simple molecules such as carbon dioxide, water and ammonia is known as catabolic reaction.

440 (c) Pyruvate is the end product of glycolysis in cells that contain mitochondria. The cells that lack mitochondria produce lactate instead of pyruvate as the end product of glycolysis.

441 (c) Glutathione in reduced form is deficient in patients with G6PD deficiency. Certain oxidant drugs such as sulfamethoxazole and primaquine produce hemolytic anemia in patients with G6PD deficiency.

442 (d) All. Oxidant drug, ingestion of fava beans, and certain types of infections may cause hemolytic anemia in patients with G6PD deficiency.

443 (b) Lactose is classified as a disaccharides. It consists of glucose and galactose.

444 (b) The pairs of structure that are mirror images of each other are known as enantiomers.

445 (b) The principal storage of glycogen in the body is found in the skeletal muscles and liver.

446 (b) Hyaluronic acid, heparin and chondroitin are classified as polysaccharides.

447 (b) Bile salts act as an emulsifying agent for metabolism of lipid in duodenum

448 (b) Steatorrhea is a result of improper secretion of bile salts from the liver and pancreatic juice from the pancreas. It normally causes a loss of lipid, fatty acid and lipid soluble vitamins in feces. The water soluble vitamins such as vitamin C, thiamine and riboflavin have no effect on their absorption.

449 (b) Sphingomyelin is a building block of membrane of nerve tissue.

450 (c) An obstruction of the gall bladder by a cholesterol stone is defined as cholelithiasis.

451 (b) Luteinizing hormone induces testosterone synthesis in Leydig cells of the testis and ovulation in females. It also stimulates synthesis of estrogen and progesterone in the corpus luteum. Follicle stimulating hormone (FSH) and testosterone stimulate spermatogenesis in the testis.

452 (d) All. BMR, thermic effect of food and physical activity help in the calculation of energy required by an individual.

✓ 453 (b) Kwashiorkor is a protein-deficient malnutrition disorder. It is usually seen in children. Skin lesions, edema, anorexia, depigmented hair and a decrease in plasma albumin concentration are common symptoms associated with this disease.

Marasmus is also known as a protein deficit disorder. It occurs due to chronic deficiency of calories and can occur even in the presence of intake of adequate protein. Weakness, anemia and extreme muscle weakness are common symptoms associated with this disease.

454 (b) Vitamin D is not a water soluble vitamin. It plays an important role in increasing the uptake of calcium by the intestine. Deficiency of this vitamin causes osteoporosis, rickettsia and hypocalcemia.

↓
455 (a) Cabbage, spinach, cauliflower, liver and egg yolk are principal sources of vitamin K. The deficiency of this vitamin causes bleeding disorder.

456 (b) The end product of purine catabolism is uric acid. The serum concentration of uric acid plays an important role in precipitating gout. Certain mammals further oxidize uric acid into allantoin, and this further degrades (only in animals) to urea or ammonia.

457 (b) The small and circular extrachromosomal DNA molecules in bacteria that carry genetic information for future generations are known as plasmids.

458 (a) Ribosomal RNA comprises 80% of total RNA. Transfer RNA comprises 15% of total RNA and Messenger RNA comprises 5% of the total RNA.

459 (a) Messenger RNA (mRNA) carries genetic information from the DNA to cytosol for protein synthesis.

460 (d) All. UAG, UGA and UAA are known as Termination codons, Stop codons or Nonsense codons. When one of these codons appears in an mRNA chain, it indicates that the peptide chain synthesis coded by the mRNA is about to be complete.

AUG is classified as Initiation codon in the process of peptide chain synthesis.

461 (a) Dark field microscopy is indicated to observe microorganisms that do not stain or are difficult to stain.

Bright field microscopy is the mostly employed microscopic method. It uses visible light. The microorganism generally appears colored on a light background.

Phase contrast microscopy is used to observe the internal structure of unstained microorganisms. The specimen should be visualized in different degrees of brightness and darkness.

Normarski microscopy is also useful for the observation of finer details of internal structures of unstained organisms. It produces three dimensional images. It has better resolution than Phase contrast microscopy.

Transmitting electron microscopy uses electron beams instead of light rays. It is used to study a thin section of cells for the details of internal structure, and is very expensive.

Scanning electron microscopy also uses electron beams instead of light rays, however it produces three dimensional views of the surfaces of specimens.

462 (c) Acid fast stains generally stain the mycobacterium species of bacteria, such as *M. leprae* and *M. tuberculosis*.

463 (b) All living cells can be classified as prokaryotic or eukaryotic. Most of the prokaryotic cells such as bacteria are unicellular organisms. These cells lack a nucleus and other membrane bound structures.

Eukaryotic cells have a nucleus and membrane bound structures. Most plants, animals and fungi fall into this class.

464 (c) Most bacteria are able to move through the long, thin, helical structure known as flagella. Bacteria with only one flagella located at one end are known as monotrichous, bacteria with two flagella located at each end are known as amphitrichous, bacteria with two or more flagella located at one or both ends are known as lophotrichous and bacteria with flagella all over the body are known as peritrichous.

465 (b) Bacteria that can move away from (negative phototaxis) or move towards (positive phototaxis) the light are known as phototaxis.

The movement of bacteria toward or away from certain substances in their environment by an unknown mechanism is known as chemotaxis.

466 (a) An AMES test can be used to find out whether a substance has the capability to produce carcinogen. A cancer producing property is usually associated with the mutagenic (capability of a substance to alter DNA) property of a substance, so determining that a substance is capable of producing mutagenicity is the first step to identify carcinogenicity of the substance.

In an AMES test, the growth medium that lacks histidine is inoculated with salmonella that requires histidine to grow. A solution of substance that needs to be tested should be placed on the plate. If colonies of salmonella (that means the substance has a mutagen ability to grow salmonella without histidine) appear then the test sub-

stance has the ability to produce mutagenicity and vice versa.

467 (b) The synthesis of protein and lipids in cells is generally carried out by endoplasmic reticulum.

468 (c) The growth of bacteria remains constant in the stationary phase, it dramatically increases in the log phase and decreases in the decline phase.

469 (b) Moisture, pH, temperature, oxygen, hydrostatics pressure, osmotic pressure and radiation are the physical factors needed for the growth of the bacteria.

Carbon source, nitrogen source, vitamins, trace elements, sulfur and phosphorus are nutritional factors for the growth of bacteria.

470 (c) When the transfer of genetic information from one cell to another cell is carried out by the plasmid, it is known as conjugation.

471 (a) A Genome (a component of the bacteriophage) carries the genetic informations necessary for replication of new phage particles. The tail sheath of bacteriophage normally helps in the transformation of genome from the head into the cytoplasm of the host cell. The plate and tail fibers normally help the bacteriophage to attach to the specific receptor site on the cell wall of the susceptible host bacterium.

472 (c) The reduction of the numbers of pathogenic microorganisms, up to such an extent they are not able to produce any kind of disease, is known as disinfection.

Sterilization is defined as the complete removal of all microorganisms from the material or an object.

A chemical agent that is used externally on various food-handling equipment to reduce microorganisms, to such an extent that it meets the public health standards, is generally known as sanitizer.

The process of killing microbes by germicidal agents is known as germicidation.

473 (d) All. Isopropyl alcohol, phenol and hydrogen peroxide are classified as antimicrobial agents.

474 (b) The process of weakening the disease producing capacity of pathogens is defined as attenuation.

The disease producing capacity of pathogens is defined as pathogenicity.

The intensity of the disease producing capacity of pathogens is defined as virulence.

475 (b) E.coli is generally responsible for causing traveler's diarrhea.

476 (b) The presence of bacteria or viruses without multiplication in the blood is defined as bacteremia or viremia . However, if pathogens are multiplied in the blood then it is known as septicemia.

477 (a) Measle is classified as an airborne disease.

478 (a) The life span of RBC is 120 days.

479 (a) Neutrophils generally guard the skin and mucous membranes against infections.

480 (b) Interferon is a small soluble protein responsible for viral interference. This protein has the unique ability to block the replication of viruses and to stimulate specific immune defenses. Different types of interferons can be pro-

duced from different cell sources. Alpha-interferon can be produced from leukocytes, beta-interferon can be produced from fibroblasts and gama interferon from T lymphocytes and NK cells.

481 (b) Immunoglobulins are in the antibody class of proteins. They can be subdivided into five major categories.

IgG: It is the major immunoglobulin found in blood. It accounts for 75% of the serum immunoglobulin and 20% of plasma protein. It is the only immunoglobulin that can cross the placental barrier to provide protection to a fetus. It is the only class of immunoglobulin whose Fc region can be recognized by phagocytosis and NK cells.

IgM: It is the first immunoglobulin produced by the body in response to antigen. It accounts for 5 to 10% of total immunoglobulins. It is the first immunoglobulin that is formed by the fetus, however it cannot cross the placenta due to its large size.

IgA: It is the major immunoglobulin secreted in external body secretions such as saliva, tears and urine. It accounts for 10% of total immunoglobulins.

IgE: This immunoglobulin plays an important role in combating helminth and allergy reactions produced by drugs, pollens or foods. The level of this immunoglobulin is found to be highly elevated in patients with allergy condition. such as asthma and hay fever.

IgD: It accounts for 1% of total immunoglobulins. It serves as an antigen receptor site in the early stages of immune response.

482 (d) IgE-immunoglobulin is found to be elevated during asthma and other allergic diseases.

483 (b) The ability of the immune system to recognize and respond quickly to foreign

substances to which it was exposed previously is known as memory.

The ability of immune system to react in a different and particular way to each foreign substance is defined as specificity.

The ability of the immune system to respond in a specific way to a great variety of different foreign substances is known as heterogeneity.

484 (b) The production of cells in the laboratory from a clone of cultured cells that make one specific antibody to a specific epitope is known as monoclonal antibody.

485 (b) Diphtheria and tetanus are prepared from the toxoid/toxin (dead virus). Measles, Mumps and Rubella are prepared from live viruses. The immunization process can be subdivided into two major categories:

Active immunization: In this type of immunization, live, attenuated or dead organisms are inserted into humans in the form of a vaccine which then produces antibodies to fight against the particular disease. This type of immunization produced by vaccines lasts for a prolonged time. Example are Measles, Mumps and Rubella.

Passive immunization: In this type of immunization, instead of injecting organisms, ready made antibodies of a particular disease are injected. It only provides temporary protection, such as immune serum immunoglobulin

486 (b) In humoral immunity, when an antigen is first encountered by the immune system, it is known as primary response. When this antigens is recognized by B and T memory cells of the body and may cause fast and efficient destruction of antigens, it is defined as a secondary response.

487 (d) All.

488 (b) Antitoxin (antibodies) are classified as passive immunizations. Mumps, Rabies and Plague vaccines produce active immunization.

489 (b) Hemolytic disease of a newborn in A Rh negative mother with an Rh-positive fetus is known as Type II hypersensitivity.

490 (c) IgE-immunoglobulins is a principal mediator of type I hypersensitivity.

491 (d) Goodpasture's syndrome, rheumatoid arthritis, SLE, Sjogren's syndrome, scleroderma and polymyositis are not organ specific autoimmune disorders. Autoimmune organ-specific disorders include :

Addisons disease, hemolytic anemia, grave's disease, hashimoto's thyroiditis, glomerulonephritis, myasthenia gravies, rheumatic fever, ulcerative colitis, junevile diabetes.

492 (b) A butterfly shaped rash is a major characteristic that identifies S.L.E.

493 (b) Wilson's disease occurs due to a disturbance in copper metabolism. In this disease the copper content of the brain increases and decreases the plasma ceruloplasmin level. Liver damage can also occur.

Copper is required with iron for synthesis of hemoglobin. It is also responsible for synthesis of enzymes responsible for melanin pigmentation of the skin.

494 (b) It is a hexahydric alcohol useful in treatment of cerebral edema. It is not indicated for treatment of cardiac edema. When administer by I.V., it acts as an osmotic diuretic. It is also indicated for treatment of barbiturate poisoning.

495 (d) All the mentioned choices impart acidity to urine, reduce the urine pH and increase absorption of acidic drugs. They increase the excretion of basic drugs and reduce their reabsorption from the renal tubules by increasing ionization of basic drugs in acidic media.

496 (b) Aldactone (Spironolactone) is an aldosterone antagonist. It is classified as a potassium sparing diuretic. It is indicated for the treatment of edema associated with CHF, cirrhosis of the liver, and nephrotic syndrome. It is also indicated for the treatment of essential hypertension and primary hyperaldosteronism. Hyperkalemia, diarrhea, cramps, gynecomastia, and lethargy are reported side effects of the drug.

497 (b) Sodium bicarbonate can be absorbed into systematic circulation and may produce alkalosis. It is classified as an antacid and alkalinising agent. It is indicated for the treatment of hyperacidity, severe diarrhea, and alkalization of urine to treat drug toxicities. The antacid action is due to neutralization of hydrochloric acid by the formation of sodium chloride and carbon dioxide. Seizure, metabolic alkalosis, milk alkali syndrome, and acid rebound with gastric distention are reported side effects of the drug.

498 (b) Parietal cells located in the stomach play an important role in secretion of acid in the stomach.

499 (d) All the mentioned receptors play an active role in secretion of HCl from the stomach, however Histamine H_2 receptors lead the group in production of acid.

500 (d) Distention of stomach by food, alkaline pH of stomach and digested protein stimulate the release of gastrin from antral G cells.

501 (b) Prostaglandin E_2 (PGE_2) plays an important role in the protection of the stomach

wall from the effect of HCl. It produces mucosa in stomach. NSAIDs generally inhibit the production of this prostaglandin and may increase the risk of G.I. ulcers and bleeding in patients. Cytotec (Misoprostol) is an analog of this prostaglandins and is indicated for treatment G.I. ulcers produced by prolonged use of NSAIDs.

502 (b) The stoppage or an impaired secretion of hydrochloric acid in the stomach is known as achlorhydria.

503 (d) The drugs used for symptomatic relief of cough are known as antitussive. When any foreign substance enters into the respiratory center, the sensory impulses pass this message to the medulla which then stimulate and secrete cough as a protective mechanism. However constant coughing in such patients may harm their respiratory muscles and will also cause breathing problems. Antitussive agents suppress the cough center in the medulla and provide relief from the coughing.

504 (b) Protamine sulfate is a heparin antagonist. It is a strongly basic polypeptide that complexes with strongly acidic heparin to form an inactive stable salt. It is indicated for the treatment of heparin overdose. Acute pulmonary hypertension, and circulatory complex with myocardial failure are reported side effects of the drug. One milligram of protamine sulfate can neutralize about 90 USP units of heparin derived from lung tissue, or about 115 USP units of heparin derived from intestinal mucosa.

505 (d) All Actinomycin, Mitomycin and rifampicin may produce their action by inhibiting DNA dependent RNA polymerase enzymes. Below is the list of drugs with their mechanisms of action.

<u>Name of drug</u>	<u>Enzyme inhibition</u>
Sulphonamide	Dihydropteroate synthetase
Trimethoprim	Dihydrofolate reductase
Quinolone	ATP dependent DNA gyrase
Penicillin	Synthesis or function of the bacterial cell wall
Cephalosporin	Same as penicillin
Erythromycin	Inhibition of protein synthesis required for growth of bacteria
Streptomycin	Inhibition of protein synthesis in bacteria by affecting 30S subunit of cell ribosomes
Tetracycline	Inhibition of protein synthesis in bacteria by affecting 30S subunit of cell ribosomes
Chloramphenicol	Inhibition of protein synthesis in bacteria by affecting 50S subunit of cell ribosomes and by inhibiting the process of translation

506 (c) Blenoxane (Bleomycin) is classified as antineoplastic agent. It is indicated for the treatment of squamous cell carcinoma. Pulmonary fibrosis, pneumonitis, hypotension, fever and chills are reported side effects of the drug.

507 (d) All.

508 (b) Sulphonamide is ineffective in patients with pus formations. Sulphonamide is a competitive inhibitor of PABA (Para Amino Benzoic Acid). Pus contains a high amount of PABA.

509 (b) The bacteriostatic action of Co-trimoxazole (Sulfamethoxazole + Trimethoprim) is due to its ability to inhibit dihydropteroate synthetase and dihydrofolate reductase. It is indicated for the treatment of UTI and P.carinii.Pneumonia. The recommended dose of the drug is one tablet by mouth twice daily. Allergic reactions, Stevens-Johnson syndrome, hemolytic anemia, and stomatitis are reported side effects of the drug.

510 (b) Methenamine is a urinary antiseptic. It decomposes in water and generates the formaldehyde. Formaldehyde is a bactericidal agent that kills bacteria. It is indicated for the treatment of UTI. The recommended dose of the drug is 1 gm b.i.d. to q.i.d after meals and at bed time. Nausea, vomiting, diarrhea, stomatitis, and urticaria are reported side effects of the drug.

511 (c) Ciprofloxacin inhibits bacterial DNA synthesis by blocking DNA gyrase. It is classified in the quinolone group of antibiotic. CNS stimulation and seizure are principal side effects of the drug. It should be carefully prescribed with antacids, tetracycline and iron supplements due to its property to form chelate with cations. The recommended dose of the drug is 500 mg to 750 mg b.i.d for 14 to 21 days.

512 (b) Vancocin (Vancomycin) is indicated for the treatment of Methicillin resistant infections and antibiotic-induced pseudomembranous colitis. Ototoxicity, nephrotoxicity, "Red-neck syndrome", hypotension, wheezing, and urticaria are reported side effects of the drug.

513 (b) Penicillin V has an acid resistant property. Methicillin, Cloxacillin, dicloxacillin and Nafcillin are penicillinase resistant penicillins.

Amoxicillin, Ampicillin, Ticarcillin and Carbenicillin are broad spectrum penicillins.

514 (b) CNS stimulation is a common adverse effect reported with the quinolone group of antibiotics.

515 (d) Ciprofloxacin, Cotrimoxazole and Nitrofurantoin are indicated for the treatment of UTI.

516 (b) Ceftriaxone, Cefotaxime, Cefuroxime and Cefoperazone are the drugs of choice for the treatment of meningitis, since they can cross the BBB (Blood Brain Barrier).

517 (b) The principal adverse effect of Ampicillin is diarrhea. With the help of a structure a activity relationship, the newly developed drug Amoxicillin has better absorption, penetrates into body tissues and has greater activity against certain microorganisms. Additionally it has better tolerance to diarrhea. Unlike Ampicillin, food does not interfere with the absorption of Amoxicillin.

518 (d) Aminoglycosides cause ototoxicity (damage to the eighth cranial nerve that results in ataxia, nausea, vomiting and deafness) with prolonged use. It is highly toxic to kidney and may cause kidney damage with high doses. A skeletal muscle relaxant property that may lead to respiratory arrest (Curarimimetic effects) is also reported with Aminoglycosides.

519 (c) Tetracycline forms chelates with calcium ion which result in defective calcification. Tetracycline should not be used in by pregnant women after the second trimester or in young children and infants. - tooth mottling.

Gray baby syndrome and bone marrow suppression are commonly reported adverse effects of Chloramphenicol.

520 (b) Dihydrostreptomycin (metabolite of streptomycin) may damage cochlear division of the ear and produce deafness.

521 (c) Arthralgia is a principal adverse effect reported with the use of Pyrazinamide. It is believed to occur due to a high concentration of uric acid in the blood, a result of a decrease in secretion of uric acid.

Malaise, fever and G.I. upset have also been reported with Pyrazinamide.

Red/Green color blindness has been reported with Ethambutol. The prolonged use of Rifampin imparts an orange color in saliva, tears and sputum.

All of the above drugs are indicated for the treatment of tuberculosis.

522 (c) Dapsone is structurally related to sulpha drugs that inhibit the synthesis of folic acid from PABA by inhibiting dihydropteroate synthetase. It is indicated for the treatment of tuberculosis. In combination with Rifampin, it is indicated for the treatment of leprosy whereas in combination with Trimethoprim, it is indicated for the treatment of P.carinii.Pneumonia. Hemolytic anemia, methemoglobinemia, nervousness, tachycardia, and pruritus are reported side effects of the drug.

523 (c) 9 times.

$$\begin{aligned}\frac{dx}{dt} &= k(a-x)(a-x) \\ &= k(a-x)^2 \\ &= k a^2\end{aligned}$$

The concentration of reactant a is triple than its original concentration, therefore we can say:

$$\begin{aligned}a &= 3a \text{ By putting this value in the above equation:} \\ &= k(3a)^2\end{aligned}$$

$$\begin{aligned} &= k \ 9 \ a^2 \\ &= 9 \ k \ a^2 \end{aligned}$$

524 (c) Fluorouracil, Cytarabine and Floxuridine are pyrimidine analogs and inhibit the synthesis of pyrimidine. Fluorouracil is indicated for treatment of hepatoma and carcinoma of the breast, ovary and prostate gland. Leukopenia and thrombocytopenia have been reported with it.

Mercaptopurine, thioguanine and pentostatin are purine analogs. They inhibit the purine synthesis. They are indicated for the treatment of leukemia and choriocarcinoma.

Pentostatin is useful for the treatment of hairy cell carcinoma.

525 (b) Chick Martin tests and Rideal walker tests are indicated to evaluate the disinfection power of a disinfectant.

526 (c) Primary alcohols have better bactericidal capacity than secondary and tertiary alcohols. At 70% concentration alcohol ionizes completely and provides optimum disinfection. At this concentration it wets the skin smoothly and evaporates slowly.

527 (b) The Rideal walker coefficient can be calculated by dividing dilution of disinfectant killed microbes in 5 to 7.5 minutes by dilution of standard solution (usually phenol) of disinfectant-killed microbes in 5 to 7.5 minutes.

528 (c) Anuria is defined as an absence of secretion of urine from the kidney. Baldness or loss of hair from the scalp is defined as Alopecia. Absence of secretion of HCl from the stomach is defined as Achlorhydria. Loss of appetite is defined as Anorexia.

529 (b) Inflammation of the lips (Cheilitis) is a commonly reported side effect of Accutane (Isotretinoin). It is indicated for the

treatment of acne. It is a vitamin A derivative. It is classified in pregnancy category X and should be strictly avoided by pregnant women. Conjunctivitis, optical neuritis, dry mouth, depression, hepatotoxicity, and an increase in blood glucose and triglycerides are principal side effects of the drug. The recommended dose of the drug is 0.5 to 2 mg/kg in two divided doses for 15 to 20 weeks.

530 (b) 34.

A = Atomic weight
P = Number of proton
N = Number of neutron

A = P + N
where A = 63, P = 29, N = ?

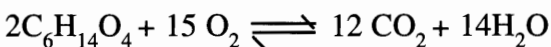
N = A - P

= 63 - 29
= 34.

531 (b) 2.4×10^{24} iron atoms.
According to avogadro constant

1 mole = 6.02×10^{23} , therefore 4 moles of Iron sulfate contain:
= $4 \times 6.02 \times 10^{23}$ atoms.
= 2.4×10^{24} atoms.

532 (a) The balance equation is stated below:



533 (b) Molecular weight of K_2CrO_4 = 194.2 gm/mole, therefore one can say that:

1 mole contains 194.2 gm of K_2CrO_4
0.5 mole contain ?

= $0.5 \times 194.2 = 97$ gm of K_2CrO_4

According to the definition of Molarity, 97 gm of K_2CrO_4 must be present in 1000 cc of solution. We need to find weight for 250 cc solution, therefore:

1000 cc solution contains 97 gram
250 cc solution contains: ?

$$= \frac{250 \times 97}{1000}$$

$$= 24.27 \text{ grams.}$$

534 (b) To solve the above problem, we have to use the following formula:

$P_1V_1 = P_2V_2$ where

$P_1 = 5.5 \text{ atm pr.}$
 $V_1 = 3 \text{ liters}$
 $P_2 = ?$
 $V_2 = 16 \text{ liters}$

$$\begin{aligned} P_2 &= \frac{P_1V_1}{V_2} \\ &= \frac{5.5 \times 3}{16} \\ &= 1.03 \text{ atm pr.} \\ &= 783.75 \text{ mm Hg. (1 atm = 760 mm Hg)} \end{aligned}$$

535 (b) To find out the volume of the gas at the same pressure, use the following formula:

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

where

$V_1 = 20 \text{ liters}$
 $T_1 = 30^\circ\text{C (} 273 + 30 = 303^\circ\text{K)}$
 $V_2 = ?$
 $T_2 = 50^\circ\text{C (} 273 + 50 = 323^\circ\text{K)}$

$$V_2 = \frac{20 \times 323}{303}$$

$$= 21.32 \text{ liters}$$

536 (c) To find out the volume of Cl_2 , use the following formula:

$$PV = nRT$$

$$\checkmark \text{ where } P = 730 \text{ mm Hg} = \frac{730}{760} = 0.96 \text{ atm}$$

$$V = ?$$

$$\checkmark n = 50 / 70.91 = 0.705 \text{ moles}$$

$$T = 273 + 30 = 303^\circ\text{K}$$

$$R = 0.082 \frac{\text{L} \times \text{ATM}}{\text{Mole K}}$$

$$V = \frac{0.705 \times 0.082 \times 303}{0.96}$$

$$V = 18.24 \text{ liters.}$$

537 (b) Since the gas behaves ideally we can say:

$$\frac{P_1V_1}{n_1T_1} = \frac{P_2V_2}{n_2T_2}$$

In our case $n_1 = n_2$ and $V_1 = V_2$ therefore re-writing the equation as:

$$\begin{aligned} \frac{P_1}{T_1} &= \frac{P_2}{T_2} \\ P_2 &= \frac{1 \times (273 + 125)}{273} \end{aligned}$$

$$= 1.45 \text{ atm.}$$

538 (b) 5.4 atm.

$$P_{\text{Total}} = P_{H_2} + P_{He_2}$$

$$P_{H_2} = P_{\text{Total}} - P_{He_2}$$

$$P_{H_2} = 10 - 4.6 = 5.4 \text{ atm}$$

539 (c) 1.176×10^{-4} moles. By using Graham's law of effusion, we can solve this problem as:

$$\frac{(\text{Mole of H}_2)^2}{(\text{Mole of N}_2)^2} = \frac{\text{Mass of N}_2}{\text{Mass of H}_2} = \frac{0.693}{0.693 \times 10^{-2}} = 100 \text{ seconds.}$$

$$\begin{aligned} \text{Mole of N}_2 &= \frac{4.4 \times 10^{-4}}{3.74} \\ &= 1.176 \times 10^{-4} \text{ moles.} \end{aligned}$$

540 (c) Normally $1 \text{ \AA} = 10^{-10} \text{ m}$, now $1 \text{ nm} = 10^{-9} \text{ meter}$, therefore one can say that $1 \text{ nm} = 10 \text{ \AA} = 10 \times 10^{-10} \text{ m} = 10^{-9} \text{ m}$

541 (b) $R = f \times w$

where R = Rate of light in vacuum
 f = frequency of light
 w = wavelength of light = ?

$$\begin{aligned} w &= \frac{2.998 \times 10^8}{10 \times 10^{14}} \\ &= 299 \times 10^{-9} \text{ m} = 299 \text{ nm.} \end{aligned}$$

542 (c) The molecular geometry of the Methane is tetrahedral. Below are examples of molecules with their possible geometry.

Name	Geometry
BeCl_2	Linear
BF_3	Trigonal planar
SO_2	Angular
CH_4	Tetrahedral
NH_3	Trigonal Pyramidal
PCl_5	Trigonal Bipyramidal

543 (b) The transfer of molecules from a solid phase directly to a vapor phase is known as sublimation.

544 (b) 100 seconds.

$$t_{1/2} = 0.693 / K$$

545 (c) The decomposition of ethylacetate in the presence of (excess) water follows the pseudofirst order kinetic reaction.

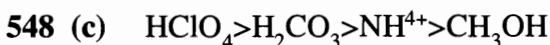
546 (b) A second order equation can be expressed by following formula:

$$\begin{aligned} \frac{dx}{dt} &= K(a-x)^2 \\ &= K(a)^2 \end{aligned}$$

But $a = a/2$ therefore the above equation can be written as:

$$\begin{aligned} \frac{dx}{dt} &= K(a/2)^2 \\ &= \frac{1}{4} K \times a^2 \end{aligned}$$

547 (b) According to Lechetiler's principal, any change in the existing system will shift the reaction in such a way that effects of the change can be nullified. In the above example, addition of CaO solution will change the equation in the "B" direction to nullify the effect of CaO .



The acidity of a substance is expressed by the ability of a substance to give away the H^+ ions. For example in HClO_4 , ClO_4^- is a powerful electron withdrawal and this will make its hydrogen ion electronless and more positive. A small amount of energy is required to remove hydrogen ions from the above substance Hydrogen ions can easily dissociate from the above molecule, and therefore it is strong acid.

In the example of CH_3OH , it is practically impossible to release the hydrogen ions from OH^- since oxygen is sharing its electron with hydrogen ions to form an octet. Therefore it is less acidic in nature.

549 (b) 0.5 gm of Li_3PO_4 are present in 100 cc of solution, therefore one can say that 5 gm of Li_3PO_4 are present in 1000 cc of the solution.

$$\begin{aligned}\text{The mole of } \text{Li}_3\text{PO}_4 &= \frac{\text{Weight in gm}}{\text{Molecular weight}} \\ &= \frac{5}{116} \\ &= 0.043 \text{ mole/1000 cc}\end{aligned}$$

$$\begin{aligned}\text{Now } \text{Li}_3\text{PO}_4 &= 3\text{Li}^{+3} + \text{PO}_4^{-3} \\ &= 3\text{S} + \text{S}\end{aligned}$$

$$\begin{aligned}\text{KSP} &= (\text{Li}^+)^3 \times (\text{PO}_4^{-3}) \\ &= (3\text{S})^3 \times (\text{S}) \\ &= 27\text{S}^4 \\ &= 27 \times (0.043)^4 \\ &= 9.22 \times 10^{-9}\end{aligned}$$

550 (c) To answer these type of questions, you must remember the following chart.

Below is the list of compounds that direct ortho and para positions:

- NH₂
- OR
- OH
- OCOR
- R
- X (Halogens)

The list of groups that direct Meta positions include :

- NO₂
- CN
- SO₃H
- CHO
- COR
- COOH
- COOR

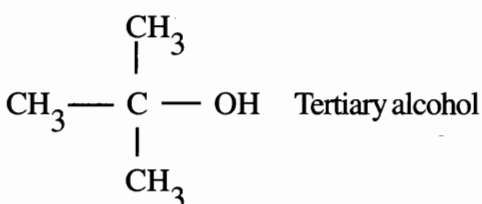
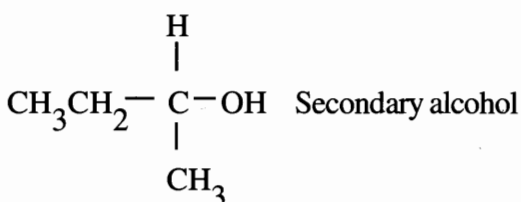
We have to find the chlorination product for

nitrobenzene (-NO₂ group), therefore the principal product would be meta-chloronitrobenzen.

551 (a) The nitration of benzaldehyde will result in meta-nitrobenzaldehyde.

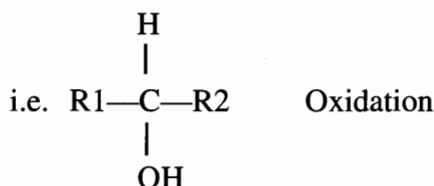
552 (c) Alcohol can be classified as primary, secondary or tertiary on the basis of the hydroxy group attached to the carbon. If the C atom has one -OH group, two H atoms and one R group, the alcohol is a primary alcohol (ethanol). If the C atom has one -OH group, one H atom and two R groups, the alcohol is secondary alcohol (2-butanol). If the C atom has one -OH group, no H atoms and three R groups, such as 2-methyl-2 propanolol, the alcohol is tertiary alcohol.

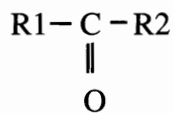
$\text{CH}_3\text{CH}_2\text{OH}$ Primary alcohol



553 (b) Acetyl phenyl ketone

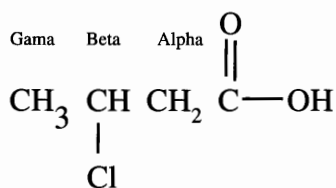
554 (c) The oxidation of secondary alcohol generally results into ketone.





The oxidation of primary alcohol will produce the aldehyde.

555 (a) Beta-chlorobutyric acid.



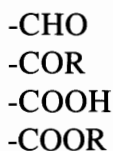
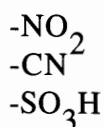
The carbon attached to the principal group (COOH) should be named as alpha-carbon, and subsequent carbons should be denoted by beta and gama.

556 (c) We know that low PKa is interpreted as an acidic compound. We have to find which compound has more acidity. To find out the acidity, we have to find the compound that can easily give away its hydrogen. In the given choices, Aniline is the compound which has an aromatic benzene ring (unsaturated) The nitrogen of the amino group will donate its electron to the unsaturated benzene ring, This will allow the hydrogen ion to leave the benzene ring easily.

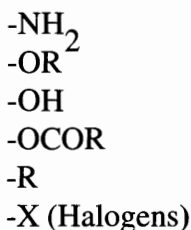
The other choices such as Methylamine (CH_3NH_2) and ethylamine ($\text{CH}_3\text{CH}_2\text{NH}_2$) have methyl and ethyl (saturated, not hungry for the electrons) respectively and will not make hydrogen easily available in the solution.

557 (b) To solve this question, the same rule will apply. Below is the chart of the electron withdrawal groups and electron donor groups.

Electron withdrawal groups: - Meta position on Ring.



Electron donor groups: - Ortho & Para position on Ring.



In the choice "B", 2,4,6 trinitrophenol has three $-\text{NO}_2$ groups (electron hungry groups), which will try to withdraw the electron from the available benzene ring. This will make the benzene ring more unsaturated. To fulfill the unsaturation created by nitrogroups, the benzene ring will pull the electron from the available $-\text{OH}$ group, which will make hydrogen more positive and easily available.

558 (a) The risk of the teratogenesis is highest during the first trimester of pregnancy. Below is the list of drugs that should be carefully prescribed or not used by pregnant women.

Lithium	Warfarin	Finasteride
VitaminA	Isotretinoin	Misoprostol
ACE inhibitor	Alcohol	Metronidazole
Tetracycline	Valproic acid	Phenytoin

559 (d) Category X is the highest risk to a fetus.

560 (b) SMZ/TMP is the antibiotic of choice for the treatment of UTI in pregnant women in the first trimester, due to less side effects as compared to the other choices.

561 (c) Benztropine.

562 (d) All. Linoleic acid, Linolenic acid and Arachidonic acid are the essential fatty acids for humans.

563 (b) 6 cc. Replacement of iron can be calculated by the following :
Replacement (mg) = blood loss x hematocrit
= 1000 cc x 0.3
= 300 mg

We have an Iron dextran injection that is available in 50mg/cc, therefore 6 cc of Iron dextran solution is required to replace the loss of iron.

564. (c) The principal energy-carrying molecule in a cells is Adenosine Triphosphate (ATP). It consists of an adenosine unit of adenine and ribose joined to three phosphate groups. It releases energy when converted to Adenosine Diphosphate. ATP is generated by energy-yielding reactions in cells such as decomposition of glucose. The breakdown of an ATP molecules is accomplished by an enzyme known as Adenosine Triphosphatase.

565 (b) Persantine (Dipyridamole) is classified as a platelets aggregation inhibitor. It is indicated as an adjunct therapy with Coumadin (Warfarin) for patients with cardiac valve replacements, and with aspirin to reduce the risk of stroke. It inhibits the uptake of adenosine by erythrocytes and tissues. This will increase the concentration of adenosine-induced effects such as coronary dilation, relaxation of smooth muscles, and inhibition of platelets aggregation. Hypotension, nausea, dyspepsia, and bleeding are reported side effects of the drug. The recommended dose of the drug is 150 to 400 mg per day.

566 (b) The intramuscular route for administration of Heparin generally produces a high risk of hematoma and should be strictly avoided.

567 (b) Heparin therapy should be monitored by regularly checking Activated Partial Thromboplastin Time (APTT). Coumadin therapy

can be monitored by checking INR (International Normalize Ratio).

568 (c) The risk of bleeding with Coumadin therapy increases with simultaneous administration of enzyme inhibitor drugs such as Cefamandole, Cephalosporin, Cimetidine and Chlorpropamide. Phenobarbital normally increases the metabolism of other drugs and may reduce the pharmacological effects and bleeding associated with Coumadin.

569 (c) Antihemophilic factors are the drugs of choice for treatment of hemophilia. In classical hemophilia, there is a deficiency of the plasma clotting factor VIII which will cause bleeding disorders. The administration of antihemophilic factors from outside reduces the risk of potential bleeding.

570 (d) Intrauterine device (IUD) is the mechanical device with the least risk of pregnancy. The risk of pregnancy for the other contraceptives are listed below, from low risk to high risk.

Oral contraceptives>
IUD>Condoms>Diaphragm>Vaginal sponges

571 (b)

572 (d) Fludrocortisone has the highest mineralocorticoid property. It is indicated for the treatment of primary and secondary adrenocortical insufficiency in Addison's disease, and for the treatment of salt-losing adrenogenital syndrome.

573 (b) Aminoglutethimide is indicated for the treatment of Cushing's syndrome (excessive secretion of adrenocorticoids). It inhibits the enzymatic conversion of cholesterol to pregnenolone, and thus reduces the synthesis of glucocorticoids and mineralocorticoids.

574 (b) Below is the summary of different insulins and their durations of action.

Insulins	Durations of action (hours)
Extended Insulin Zn susp (Ultralente)	> 36 hours
Protamine Zn Insulin susp (PZI)	36 hours
Insulin Zn susp (Lente)	24 hours
Isophane Insulin Susp. (NPH)	24 hours
Prompt Insulin Zn susp (Semilente)	12-16 hrs
Insulin Inj (regular)	6 to 8 hrs
Insulin Lispro	2 to 3 hrs

575 (c) Insulin is secreted by the beta cells of the pancreas. It is the principal hormone required for glucose metabolism. Insulin preparations are generally extracted from pork or beef. Human insulin is derived by a biosynthetic process from the strains of *E.coli*. It is the least antigenic in nature compared to pork and beef insulin.

576 (d) “Insulin resistant” is defined as when a patient needs more than 200 units of insulin per day.

577 (d) All. Below is the summary of symptoms associated with each disease:

Hypoglycemia:

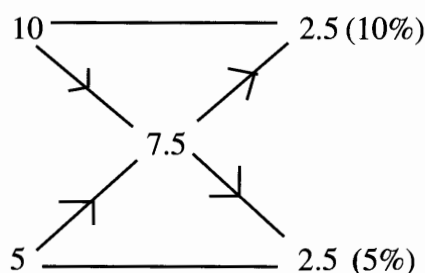
- * Absence of glucose and ketone in urine
- * Hunger, numbness and tingling
- * Confusion, diplopia, convulsions
- * Tachycardia
- * Confusion

Ketoacidosis:

- * Presence of Acetone and glucose in urine
- * Loss of appetite, abdominal pain
- * Acetone breath
- * Rapid pulse

578 (a) 1 grain = 64 milligrams, therefore
1/4 grain = 16 milligrams.

579 (a) To solve this kind of problem, we need to use the alligation method.

**Total part 5.0**

Total parts (7.5%)

Parts of (5%

5
500

2.5
?

$$= \frac{500 \times 2.5}{5}$$

= 250 cc of 5% solution when mixed with 250 cc of 10% solution (500cc - 250cc) will give us 500 cc of 7.5% Potassium Iodide solution.

580 (c) Midamor (Amiloride) is a potassium sparing diuretic that acts by inhibition of $\text{Na}^+ \text{K}^+ \text{ATP}$ ase activity. It is indicated for the treatment of edema associated with CHF, hepatic cirrhosis, and nephrotic syndrome. Hyperkalemia, lethargy, weakness, electrolyte loss, and hypotension are reported side effects of the drug. The recommended dose of the drug is 5 to 10 mg per day.

581 (b) 22.5 grams of mannitol.

100 cc solution contains 15gm of Mannitol
150 cc solution contains: ?

$$= 15 \times 150 / 100$$

$$= 22.5 \text{ grams of mannitol.}$$

582 (d) To solve this problem, we have to first find out the amount of mannitol present in 75 cc of 25% solution.

100 cc soln contains 25 gm of mannitol
75 cc soln will contain ?

$$= 25 \times 75 / 100$$

$$= 18.75 \text{ gram of mannitol. This same amount of mannitol present in 800 cc of the final solution, therefore}$$

800 cc soln contain 18.75 gm mannitol
100 cc soln ?

$$= 100 \times 18.75 / 800$$

$$= 2.34\% \text{ of mannitol}$$

583 (c) Lanoxin (Digoxin) is classified as an inotropic agent, an agent that increases the force of contraction of the heart. It is indicated for the treatment of atrial flutter, atrial fibrillation, and CHF. It should not be used for treatment of ventricular fibrillation since it may induce automaticity to ventricles, which may worsen the ventricular fibrillation. The recommended dose of the drug is 0.125 mg to 0.25 mg per day. The normal therapeutic serum concentration of the drug is 0.7 to 1.4 ng/ml. Anorexia, hypotension, edema, ventricular fibrillation, and convulsion are reported side effects of the drug. The drug should be carefully prescribed with other agents which may induce hypokalemia.

584 (b) Myxedema is a thyroid disorder that occurs due to hyposecretion of the thyroid hormone. It would normally reduce the rate of

excretion of the drug and may increase the serum concentration of it in blood. Lanoxin dose should be reduced and closely monitored in such patients.

585 (d) All.

586 (b) The prolonged use of Amrinone will result in severe thrombocytopenia. Amrinone has vasodilation as well as positive inotropic (increase contraction of heart) properties. It is usually known as an Inodilator (Inotropic + Dilation). It is indicated for the treatment of CHF.

587 (b) Below is the summary of various nitroglycerine products and their onset of actions.

Dosage forms	Onset of action (min)
I.V.	1 to 2
Sublingual	1 to 3
Translingual spray	2
Transmucosal tab	1 to 2
Oral, sustain release	20 to 45
Topical oint	30 to 60
Transdermal	30 to 60

588 (c) Dissolve one tablet under the tongue at the acute onset of an angina attack; repeat every 5 minutes until complete relief is achieved. Do not exceed more than 3 tablets within 15 minute period.

589 (c) I.V. administration of 1/6 molar sodium lactate solution causes a marked decrease in the cardio toxic effects of Quinidine. Administration of Diazepam or other benzodiazepines is contraindicated since profound CNS depression may occur during Quinidine toxicities.

590 (c) Ringing in the ear, headache, nausea, vertigo and vision disturbances are common side effects reported with quinidine.

591 (a) Quinidine sulfate contains the highest amount of anhydrous quinidine alkaloids. Below is the summary of various salts of quinidine and their alkaloid content:

Quinidine sulfate	83%
Quinidine gluconate	62%
Quinidine polygalactouronate	60%
Quinidine hydrochloride	0%

592 (b) The use of (Procan) Procainamide is highly contraindicated for patients with Myasthenia gravis. Its anticholinergic type of action decreases the acetylcholine released at the skeletal muscle motor nerve ending and may worsen the disease. It is classified as a class IA antiarrhythmic agent. It is indicated for the treatment of ventricular arrhythmia. Lupus erythematosus-like syndrome, agranulocytosis, hemolytic anemia, and heart block are reported side effects of the drug.

593 (b) Procainamide and Hydralazine may cause SLE (Systemic Lupus Erythematosus). It is more likely to occur in patients with slow acetylators. Arthritis, polyarthralgia, pleuritic pain, myalgia, skin lesions, fever, headache and fatigue are commonly reported signs of SLE. Closely monitor symptoms of the disease and ANA (Antinuclear Antibody) titer.

594 (c) Norpace (Disopyramide) is classified as a class IA antiarrhythmic agent. It is indicated for the treatment of life-threatening ventricular arrhythmia. It has a powerful negative inotropic (reduction in the force of contraction of heart) effect that is highly contraindicated for patients with CHF. Severe myocardial depression with hypotension, anticholinergic side effects such as dry mouth, urinary retention, constipation, and blurred vision, and symptoms of lupus erythematosus are reported side effects of the drug.

595 (d) Malignant hyperthermia, CNS toxicity and hepatic failure are reported side effects of Lidocaine.

596 (c) Class IC antiarrhythmic agents such as Flecainide, Encainide and Propafenone should be reserved for life-threatening arrhythmia because of their profound -ve inotropic action.

597 (a) Potassium chloride contains the highest mEq amount of potassium. Below is the summary of various potassium salts and their contents in mEq.

Potassium chloride	13.4 meq
Potassium bicarbonate	10.0 meq
Potassium citrate	9.8 meq
Potassium gluconate	4.3 meq
Potassium acetate	10.2 meq

598 (b) Beta-carotene and rhodopsin are derivatives of vitamin A that help in visual adaptation to darkness. Physiological roles of other derivatives are as follows:

Retinol	Supports the reproductive cycle
Retinal	Functions in the visual cycle
Retinoic acid	Promotes the growth, differentiation and maintenance of epithelial tissues.

599 (d) All. Ergosterol, 7-dehydrocholesterol, and dihydrotachysterol are precursors of vitamin D.

600 (b) Calcium gluconate has the lowest amount of elementary calcium (4.6 meq). Below is the summary of other calcium salts and their calcium contents:

Calcium carbonate	20 meq
Calcium gluconate	4.6 meq
Calcium citrate	12 meq
Calcium acetate	12.6 meq
Calcium lactate	9.2 meq
Calcium chloride	13.6 meq

601 (b) Quinidine is an alkaline drug in nature, and therefore administration of a urinary alkalizer will increase the reabsorption of quinidine from the renal tubules and the toxic effects of drugs. Methotrexate, Salicylate and Methenamine are acidic in nature and alkalization of urine will increase the excretion of these drugs.

602 (c) Sodium polystyrene sulfonate is indicated for removal of excess potassium ions from the blood. It is a cation exchange resin indicated for treatment of hyperkalemia. The sodium ions of resin are replaced with potassium ions. The therapeutic recommended dose of the drug is 15 grams four times day.

603 (b) Megace (Megestrol) is classified as a synthetic progestin. It is indicated for the treatment of advanced endometrial or breast cancer. It is also used as an appetite stimulant agent in AIDS patients. The recommended dose of drug for appetite stimulation is 400 mg twice a day. Cardiomyopathy, hypertension, and seizure are reported side effects of the drug.

604 (b) Proscar (Finasteride) is indicated for the treatment of BPH. It is a specific inhibitor of 5 alpha azo-reductase enzyme, an enzyme responsible for conversion of testosterone into dihydrotachysterone (DHT). Prostate cancer is highly sensitive to a DHT concentration. It is contraindicated in women who are or may become pregnant. The recommended dose of the drug is 1 mg once a day with or without meals. Impotence, decreased libido, decrease volume of ejaculate are reported side effects of the drug.

605 (b) Pelionis hepatitis, a condition in which the liver and splenic tissue are replaced with blood-filled cysts, is a major adverse effect associated with anabolic steroids. It may lead to liver failure.

606 (b) Prostate cancer is known to be sensitive to dihydrotestosterone.

607 (c) Oxytocin is classified as an oxytocic agent. It is the hormone secreted from the posterior pituitary. It induces or stimulates labor at term. It is also indicated for the treatment of uterine inertia. Anaphylaxis, hyperstimulation of uterus, and hypertensive episodes are reported side effects of the hormone.

608 (d) All. Etidronate Na, Alendronate Na and Tiludronate sodium are indicated for treatment of paget's disease of bone. Estrogen deficiency enhances the rate of bone resorption by osteoclasts. This will lead to a significant amount of loss of calcium from the bone. All the mentioned choices inhibit the rate of bone resorption by osteoclasts.

609 (c) (Humalog) Insulin Lispro is an rDNA origin derived from E.coli. It is a human insulin analog. It has a rapid onset of action and the shortest duration of action. It is indicated for the treatment of diabetes. Hypoglycemia, tachycardia, confusion, and lipoatrophy are reported side effects of the drug.

610 (b) Diabinese (Chlorpropamide) is classified as an oral sulfonyl urea agent. It should be carefully prescribed to geriatric patients because of its prolonged elimination half-life. The half-life of the drug in normal patients is 24 to 60 hours. It is indicated for the treatment of type II diabetes mellitus. The recommended dose of the drug is 100 mg to 250 mg in single or divided doses. Hypoglycemia, tachycardia, diarrhea, and water retention are reported side effects of the drug.

611 (b) Acarbose inhibits the breakdown of table sugar (sucrose) in glucose and fructose. It is an inhibitor of alfa-glucosidase enzymes. It is recommended to use dextrose instead of sucrose for treatment of hypoglycemia cause by this drug.

612 (b) The chance of hepatotoxicity is the highest with use of Troglitazone. This will restrict the use of this agent in the treatment of diabetes.

613 (d) A patient with hypersensitivity to thiazide diuretic needs to be careful with the use of drugs that contain sulpha groups. All the given choices are structurally related to thiazide diuretic and should be carefully prescribed for a patient with a hypersensitivity to it. Also, sulphonamide groups of antibiotics, oral sulfonylurea agents and celecoxib have sulpha groups in their structures and should be questioned by the pharmacist before filling.

614 (b) Propylthiouracil (PTU) is classified as an antithyroid agent. It inhibits the thyroid production by preventing the incorporation of iodide into tyrosine and coupling of iodotyrosines. It is indicated for the treatment of hyperthyroidism. It can be safely administered to pregnant women due to low fetal side effects. Agranulocytosis, hemolytic anemia, skin rash, urticaria, hepatitis, and nephritis are reported side effects of the drug. The recommended dose of the drug is 300 mg to 900 mg per day in divided doses.

615 (d) All. Desmopressine is indicated for the treatment of diabetes insipidus, hemophilia A, williebrand's disease.

616 (b) Octerotide acetate is a long-acting octapeptide with pharmacological actions similar to somatostatin. It is a potent inhibitor of growth hormone compared to natural hormone somatostatin. It is indicated for treatment of acromegaly, a condition in which hypersecretion of growth hormone has been reported.

617 (b) Lactulose and sodium benzoate and phenylacetate are indicated for the treatment of hyperammonia.


Sodium benzoate and phenylacetate reduce the ammonia content in a patient with inborn errors of ureagenesis. They provide conjugation reactions involving the acylation of aminoacids, which results in a decreased formation of ammonia.

Lactulose, degraded in a colon by colonic bacteria into organic acids, results in a reduction the elevated pH of the colon. This will convert the blood ammonia into ammonium ions which then are entrapped and excreted in feces.

618 (b) Prolonged therapy (approximately 6 to 36 months) with Bromocriptine may cause pulmonary infiltrate, pleural infusion and pleural thickening, and should be monitored by regularly checking pulmonary function. It is a semi-synthetic ergot alkaloid indicated for treatment of parkinsonism.

619 (d) All. Probenecid is a uricosuric agent indicated for treatment of gout. It may elevate the serum concentrations of methotrexate, retrovir and pantothenic acid's by competing with these agents for renal tubular secretion.

620 (d) Amyl nitrite is indicated for the treatment of cyanide poisoning.

 **621 (c)** Mesna is commonly employed for the treatment of Cyclophosphamide induced H. cystitis. Acrolein and 4 hydroxy-cyclophosphamide metabolites of Cyclophosphamide are responsible for this. Mesna reacts with these toxic metabolites and makes them inactive.

622 (d) All. Naloxone, Nalmefene and Naltrexon may antagonize the action of opioid drugs.

623 (c) Romazicon (Flumazenil) is classified as a benzodiazepine receptor antagonist. It is indicated for the treatment of benzodiazepine

overdose. It reverses the sedation produced by benzodiazepines. Seizures and arrhythmia are reported side effects of the drug.

624 (a) Activated charcoal is not indicated for drug intoxication in unconscious patients. It is a carbon residue derived from organic material by exposing it to an oxidizing gas compound of steam, in the presence of acid at a high temperature. Each gm of charcoal is capable of binding 100 mg to 1000 mg of the drug.

625 (d) Alkalinization of urine increases the bioavailability of Flecainide.

626 (d) Atenolol, Acebutolol, Metoprolol and Betaxolol are cardio selective beta-1 receptors blockers indicated for the treatment of hypertension.

627 (c) A positive Comb's Test helps to identify hemolytic anemia associated with Methyldopa.

628 (d) All. Weight variation, disintegration, and dissolution tests are used to evaluate the tablet dosage form.

629 (a) The breakdown of tablets into smaller particles or granules is defined as disintegration.

630 (d) The following are commonly occurring problems in the process of manufacturing tablet.

Sticking : Adherence of granules to the die wall is referred to as sticking. Polishing of die wall and addition of lubricant may solve the problem.

Picking : Material from the tablet surface comes off and adheres to the face of punches.

Capping : The top or bottom part of the tablet is separated from the main body. A change in pressure or speed of the tablet machine, or the addition

of stearic acid, may solve the problem.

Lamination : In lamination, the tablet breaks into two or more layers. A change in pressure or the speed of the tablet machine, or addition of stearic acid, may solve the problem.

Chipping : When a small amount of powder from the tablet comes off, it is defined as chipping.

Mottling : Uneven distribution of color on the surface of the tablet is known as mottling. It can be prevented by either changing the solvent system or by drying at a low temperature.

631 (a) Below is the classification of different ingredients employed in formulation of tablets.

Diluents: Lactose
Microcrystalline cellulose
Mannitol
Sorbitol
Dibasic calcium phosphate

Binders: Acacia
Starch
Gelatin
Glucose
Tragacanth

Disintegrants: Starch
Cellulose

Lubricant: Stearic acid and its derivative

Glidants: Talc
Corn starch
Silica derivative

632 (b) Glidants normally improve the flow property of granules. Talc, corn starch and silica are commercially available glidants for the tablet.

633. (c) Calcium phosphate may form chelation with tetracycline and should be avoided.

634. (c) Dibasic Calcium Phosphate and Calcium sulfate have an advantage of possessing a low concentration of unbound moisture and have little affinity for atmospheric moisture and may be more beneficial to use with water sensitive ingredients.

635. (c) The browning and discoloration of amine containing drugs in the presence of lactose is defined as Millard reaction. Lactose should be avoided with such ingredients.

636. (a) Below is the list of commercially available ingredients and their brand names.

Name	Brand name
Hydrolyzed starches (diluent)	Emdex celutab
Microcrystalline cellulose (diluent)	Avicel
Dextrose (diluent)	Cerelose

637. (b) Menthol is a commonly employed diluent, in chewable tablet, due to its negative heat of dissolution.

638. (b) Acacia and Tragacanth are naturally occurring gums indicated as binders in the formulation of tablets. Gelatin is a natural protein used as binder.

639. (c) Ac-di-sol is a commercially available brand name for one of the cellulose derivatives indicated as a disintegrant. The other choices such as sorbitol and dibasic calcium phosphate are diluents. 50% glucose solution is used as a binder in tab formulation.

640. (d) All. The coating of tablets mask the taste, odor or color of the drug. It also con-

trols the release of drug from the tablet. It protects the drug from disaster effect of stomach acid.

641. (b) Lubricant reduces the friction during tablet ejection between the walls of tablet and the walls of the die cavity in which the tablet is formed.

642. (c) Index medicus is drug information literature in which citations are arranged alphabetically by first author and by subject headings. It covers more than 3000 journals. Monthly issues are cumulated annually in cumulated index medicus.

IPAs (International Pharmaceutical Abstracts) and SCIs (Science Citation Index) are also classified under indexes and abstracts that help to identify various articles with author names.

643. (c) D-List is a useful reference source to find out about drugs which have been withdrawn from the U.S. market for a particular year. Products are listed alphabetically by trade name, or by generic name when all brands of a particular drug have been withdrawn. The reference source includes only those dosage forms and strengths which have been withdrawn from the market.

AMA drug evaluation, Drugdex and PDR (Physician Desk Reference) provide the therapeutic and dosage information of drugs.

644. (d) All the mentioned reference sources help to find out the correct physical identification of drugs. Identidex is a system that helps to identify tablets and capsules. The information is listed alphabetically and numerically by imprint code. The description, color and ingredients of tablets are provided in addition with manufacturer information.

645. (b) The American Druggist Blue Book and Drug Topic Red Book help to identify the wholesale and retail price of drugs. They also

provide a manufacturer directory, manufacturer catalog and full-color product identification guide.

646. (d) IPA model HMO has the highest percentage of members (about 67%) among all the HMO models. They do not have medical facilities their own. They contract with independent physician associations or groups of physicians or independent physicians to provide services to customers. They also contract with other community based hospitals and other healthcare service providers, such as various laboratories and diagnostic centers, to provide services to customers. They are also affiliated with various chain pharmacies, independent pharmacies, and certain mail order pharmacies to provide pharmacy services to their members.

Staff model HMO covers 6 percent of membership of the total percentages. They generally are employed by the physicians on a salary basis. These physicians treat the members in various facilities that are owned by the HMO. They provide cost effective services since they employ the physicians and other healthcare providers. Many of these types of HMO's own the large hospitals. They are the most economic or cost-controlled type of HMO among all given choices. Pharmacy service is normally provided by the In-house pharmacies located in various medical centers or hospitals. For convenience of members, they often contract with various chain pharmacies and mail order pharmacies to provide services to members.

Group model HMO covers 13 percent of membership of the total percentages. They contract with different physician groups which can provide wide a variety of medical services (e.g. from individual practitioner to surgery specialist physicians). Pharmacy service is provided in the same way as it was mentioned in Staff model HMO. An example would be Kaiser Permanent Health Plan.

Network model HMO represents 14 percent membership of the total percentages. Like Group Model HMO, they also contract various physician groups which can provide a wide range of medical services. The only difference between Group model HMO and Network model HMO is that the latter one covers a wide geographic region compared to former one. Pharmacy services are provided the same way as Staff model HMOs.

647. (b) Physicians participating in IPA HMOs are generally reimbursed by either capitation or discounted FFS. As with Staff model HMOs, they are not salary based employees.

In capitation reimbursement, physicians receive a fixed monthly fee for providing services to plan members regardless of patients visit to the physicians.

In discounted FFS reimbursement, most of the physicians receive 80 percent of reimbursement for services provided. The other 20 percent is withheld. This withheld 20 percentage is received by physicians or groups of physicians who proved to be most economic and efficient at the end of the year.

648. (c) 1 millimicron or nanometer is equal to 10 \AA

$$\begin{aligned} 1 \text{ millimicron} &= 10^{-9} \text{ m} \\ 1 \text{ angstrom} &= 10^{-10} \text{ m} \end{aligned}$$

$$\begin{aligned} 1 \text{ millimicron} &= 10 \times 10^{-10} \text{ m} \\ &= 10 \times \text{\AA} \end{aligned}$$

649. (d) All. A "normal" or "standard" drop measure was first recommended by the Brussels Conference of 1902 for international adoption. According to it, the dropper must have an external diameter of 3mm and should deliver 20 drops of water (the total weight of which is between 0.9 g to 1.1 g at 25°C) when held vertically.

650. (d) The specific gravity of Carbon tetrachloride can be expressed by following formula:

$$\text{Sp gravity} = W_s / W_w, \text{ where}$$

W_s = Weight of the substance

W_w = Weight of an equal volume of water

$$\text{Sp gravity} = 2500 / 2000 = 1.25$$

651. (a) Density of the substance can be expressed by the following formula:

Density = weight/volume, therefore the correct unit would be gm/cc.

652. (d) The pH of the solution is expressed by the following formula:

$$\begin{aligned} \text{pH} &= -\log [H_3O^+] \\ &= -\log [10^{-4}] \\ &= 4 \end{aligned}$$

653. (c) In a statistic, Bias refers to a systematic difference from the true value. The closeness of measurement is generally expressed by accuracy and the reproducibility of result is known as precision.

654. (b) Vasculitis angiitis is defined as a patchy inflammation of the walls of small blood vessels. It is normally caused by Accolate (Zafirlukast).

655. (c) DPM is an abbreviation for Podiatrist. Below is the list of abbreviations:

Name	Abbreviation
Medical doctor	MD
Dentist	DDS or DMD
Nurse practitioner	NP
Optometrist	OD
Podiatrist	DSC, PodD, DPM
Veterinarian	DVM
Physician assistant	PA
Chiropractor	DC

656. (b) A 1N solution of sodium bicarbonate contains 84 gm / mole, therefore:

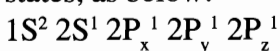
1000 cc 1 N solution contains 84 gm

1000 cc 0.01 N solution contains 0.84 gm

1000 cc 0.05 N solution contains 4.2 gm

300 cc 0.05 N solution contains 1.26 gm

657. (b) $CH_2 = CH_2$ is classified as SP^2 hybridization. The electronic configuration of carbon atoms is $1S^2 2S^2 2P_x^1 2P_y^1 2P_z^0$. This electron configuration normally changes in excited states, as below:



The union of two carbon atoms of this type produces a multiple bond, involving two electron pairs (a double bond). Overlaps of SP^2 orbitals form a sigma bond and P orbital overlap produces a pi bond.

658. (c) $C = C$ bonds require the highest amount of energy to break the bonds. They require 193 kcal / mole to dissociate bond. $Cl-Cl$ bonds require the least amount of energy (about 57.8 kcal/mole) for dissociation.

<u>Bonds</u>	<u>Energy required (Kcal/mole)</u>
H-H	103.2
H-Cl	102.1
O-H	109.4
N-H	92
C-H	98
C-Cl	78
Cl-Cl	58
C-C	80
C=O	152
C=C	193

659. (a) Soluble.

Description	Parts of solvent for 1 part of solute
Very soluble	Less than 1
Freely soluble	From 1 to 10
Soluble	From 10 to 30
Sparingly soluble	From 30 to 100
Slightly soluble	From 100 to 1000
Very slightly soluble	From 1000 to 10,000
Insoluble	More than 10,000

660. (c)

$$\begin{aligned}
 K_a &= K_w / K_b \\
 &= 1 \times 10^{-14} / 1 \times 10^{-4} \\
 &= 1 \times 10^{-10}
 \end{aligned}$$

$$\begin{aligned}
 [H_3O^+] &= \sqrt{\frac{K_a \times C_a}{1 \times 10^{-10} \times 9 \times 10^{-2}}} \\
 &= 3 \times 10^{-6}
 \end{aligned}$$

661. (a) Cationic agents. A number of long chain cations, such as amine salts and quaternary ammonium compounds, are often used as preservatives in pharmaceutical preparations due to their antimicrobial action. They absorb very quickly on the cell membrane of bacteria and fungi due to their positive charges. This will lead to lysis of the cell membrane of bacteria and fungi. It is in this way useful as a preservative in pharmaceutical preparations.

662. (d) All. The small intestine is the primary site for absorption of an orally administered drugs because the intestine epithelium is more permeable to drugs than the stomach. The absorptive area of the intestine is greater than that of the stomach. The total blood flow through the intestine capillaries is much greater than the stomach.

663. (a) Enzyme inhibition interactions occur much more rapidly than induction interactions. They are the most clinically significant type of interactions. Inhibition of substrate metabolism tends to begin as soon as sufficient concentrations of the inhibitors are reached. Elderly pa-

tients are at a greater risk of enzyme inhibition interactions.

664. (d) The decline in baroreceptor function generally causes orthostatic hypotension. Baroreceptors are located in the aortic arch and the carotid sinus, and are responsible for detecting and correcting changes in blood pressure. In younger individuals, a decrease in blood pressure is detected by the baroreceptors, which in turn increases the heart rate in an effort to correct the falling blood pressure.

665. (b) The most widely prescribed Estrogen Replacement Therapy (ERT) for treating menopause symptoms is conjugated esterified estrogen (Premarin).

666. (a) Estrogen deficiency is the major cause for hot flashes.

667. (a) The prostate gland is located below the bladder in men. It surrounds the urethra, which is a tube that drains urine from the bladder. Due to enlargement and tightening of muscles of the prostate gland, pressure is exerted on the urethra. The squeezing of the urethra results in slow flow of the urine from the bladder; which apparently causes the symptoms of BPH.

Symptoms of BPH:

- * a weak or interrupted stream when urinating
- * a feeling that you cannot empty your bladder completely
- * a feeling of delay when you start to urinate
- * a need to urinate often, especially at night
- * a feeling that you must urinate right away

668. (c) T lymphocyte is the primary cell type responsible for long-term effects of asthma.

669. (c) IgE is the primary immunoglobulin associated with asthma. Normally, degranulation of mast cells is a major contributing factor to the course of asthma. Once allergens bind to IgE, histamine, leukotrienes, prostaglandins, and other inflammatory mediators are released. This leads to excessive mucous secretion in the airway, bronchoconstriction of smooth muscle, and labored breathing.

670. (d) All. Tobacco smoke, exercise and cold air may trigger an asthma attack.

671. (c) Wheezing is the clinical hallmark of asthma. Wheezing is defined as a high-pitched sound caused by turbulent airflow passing through an obstructed airway.

672. (b) Wheezing is defined as a high-pitched sound caused by turbulent airflow passing through an obstructed airway.

673. (d) Blood dyscrasias that affect all three cell lines including leukocytes, thrombocytes and red blood cells are defined as Pancytopenia.

Blood dyscrasias that affect only red blood cells are defined as anemia. Blood dyscrasias that affect white blood cells are known as agranulocytosis, granulocytopenia or leukopenia. When thrombocytes are affected by blood dyscrasia, it is known as thrombocytopenia.

674. (c) Aplastic anemia is associated with the highest morbidity and mortality among all the hematological disorders. Deaths from drug-induced aplastic anemia can approach 50%.

675. (d) All. Erythrocytes contain a relatively high concentration of reduced glutathione (GSH), which protects the red cells from oxidative injury and stress. GSH also prevents the oxidation of hemoglobin to methemoglobin. Certain drugs can produce oxidative radicals that can destroy red blood cells. GSH reduces the oxidative radicals and protects the red blood cells.

Drugs that cause hemolytic anemia in G6PD deficiency include:

Chloramphenicol	Dapsone
Co-trimoxazole	Aspirin
Primaquine	Nitrofurantoin
Quinine	Sulfanilamide
Dimercaptol	Nalidixic acid
Sulfapyridine	Sulfacetamide

676. (d) All. Patients may experience fatigue, bruising, frank bleeding, and infections, associated with anemia, thrombocytopenia and neutropenia.

677. (a) The range for a normal white blood count is 4,500 to 11,000 cells/mm³. When a granulocyte count is less than 1500 cells/mm³, it is known as granulocytopenia. Agranulocytosis is a severe form of granulocytopenia, when the total granulocyte count is less than 500 cells/mm³.

678. (b) Haptane.

679. (a) S.pneumonia is the most causative agent for Community Acquired Pneumonia. It is identified in 25 to 60% of all community-acquired bacterial pneumonias.

680. (d) Xerostomia or dry mouth is common in the elderly, and can be exacerbated by medications such as antihistamines, decongestants, antipsychotic agents and certain antidepressants. It does not contribute to excessive salivation. It causes dental caries, difficulty in swallowing medications and significant distress to patients.

681. (d) The decline in baroreceptor function generally causes orthostatic hypotension. Baroreceptors are located in the aortic arch and the carotid sinus, and are responsible for detecting and correcting changes in blood pressure. In younger individuals, a decrease in blood pressure is detected by the baroreceptors, which in

turn increases the heart rate in an effort to correct the falling blood pressure.

682. (a) In general, drugs are normally metabolized in two sessions. Phase I reactions and Phase II reactions. In elderly patients; phase I reactions such as oxidation, reduction, hydroxylation and dealkylation might be decreased and drugs that undergo phase I reactions can accumulate in the body. For example, benzodiazepines such as diazepam and chlordiazepoxide are primarily metabolized by phase I reactions, and their metabolism might be prolonged in elderly patients compared to in younger patients. On the other hand drugs that undergo phase II reactions are not affected by increased age; therefore drugs such as lorazepam, temazepam and oxazepam that do not undergo phase I metabolism may not significantly accumulate in elderly patients.

683. (c) Norvasc (Amlodipine) is classified as a calcium channel blocker. It is indicated for the treatment of essential hypertension and chronic or vasospastic angina. The recommended dose of the drug is 5 mg to 10 mg per day. Hypotension, tachycardia, edema, and lightheadness are reported side effects of the drug.

684. (d) To solve this problem, we need to find at which pH the drug produced maximum unionized species.

$$PKw = PKa + PKb$$

$$\begin{aligned} pH &= PKw - PKb + \log \text{base/salt} \\ &= PKa + \log \text{base/salt} \\ &= 8 + \log \text{base/salt} \\ &= 8 + \log \text{base/salt} \end{aligned}$$

If the pH = 10, we will get a maximum unionized species of the drug.

$$\begin{aligned} 10 &= 8 + \log \text{base/salt} \\ 2 &= \log \text{base/salt} \end{aligned}$$

$$\text{base} = 100 \times \text{salt}$$

This indicates that unionized species of the drug (base) is 100 times ionized species of the drug (salt).

685. (b) Ten hours after 750 mg of a drug with a half-life of 5 hours and a required (Minimum Effective Concentration) MEC of 3 mcg/ml is administered, we can say:

HOURS	MEC
10 (after)	0 mcg/ml
0	20 mcg/ml
5	10 mcg/ml (half life = 5 hours)
5	5 mcg/ml (half life = 5 hours)
5	2.5 mcg/ml (half life = 5 hours)
25 HOURS	2.5 mcg concentration

MEC is 3 mcg/ml, so the next dose should be administered approximately between 20 to 25 hours after the first dose.

686. (b) This example can be calculated by the following equation.

$$F = \frac{6Vy}{d}, \text{ where}$$

F = Energy output required for a stable system
V = Volume of dispersed phase in ml
y = Interfacial tension in dyne/cm
d = Mean diameter of particle = 2r

$$F_A = \frac{6 \times 10 \times 80}{4 \times 1}$$

$$F_B = \frac{6 \times 100 \times 80}{4 \times 1}$$

$$\frac{F_A}{F_B} = \frac{10}{100}$$

$$F_A = F_B/10,$$

We require ten times less energy to redisperse System A, therefore it is 10 times more stable than System B.

687.(d) The equation for the first order kinetic is as follows:

$$\text{Log } a / (a-x) = k t / 2.303$$

a = amount initially present = 100
 x = amount degraded in time $t = 90$
 $(a-x)$ = amount that remains after time $t = 10$
 k = reaction velocity constant = 5×10^{-4}
 t = ?
 $\text{Log } 100/10 = 5 \times 10^{-4} \times t / 2.303$
 $\text{Log } 10 = 5 \times 10^{-4} \times t / 2.303$
 $1 \times 2.303 / 5 \times 10^{-4} = t$
 $= 4606 \text{ years.}$

688. (a) This problem can be solved by using the following formula:

$$K = \frac{1}{t} \times \frac{X}{a(a-x)} \quad \text{where}$$

K = rate constant = 1.082 liters (mole.min)
 X = consuming concentration = 0.01 M
 a = initial concentration = 0.1 M
 $a-x$ = remaining concentration = 0.09 M

$$t = 0.01 / 1.082 \times 0.1 \times 0.09$$

$$= 1.026 \text{ minutes}$$

689. (c) This can be calculated by the following formulas:

$$\text{I. } AUC = \frac{F \times D_o}{V_d \times K}$$

therefore,

$$V_d = \frac{F \times D_o}{AUC \times K}$$

$$\text{II. } C_{ss} = \frac{R}{V_d \times K} \quad \text{where}$$

$$\text{III. } R = \frac{D_o \times F}{T}$$

$$AUC = \text{Area under the curve} = 360 \text{ mcg/hr/ml}$$

$$F = \text{bioavailability} = 80\% = 0.80$$

$$D_o = \text{loading dose} = 500 \text{ mg}$$

$$V_d = \text{volume of distribution} = ?$$

$$K = \text{rate constant} = 0.693/t_{1/2}$$

$$T = \text{dosing frequency} = 12 \text{ hours}$$

If we place R and V_d values in equation II, we will get

$$C_{ss} = \frac{D_o \times F \times AUC \times K}{T \times F \times D_o \times K}$$

$$= \frac{AUC}{T}$$

$$= \frac{360 \text{ mcg/hr/ml}}{12 \text{ hours}}$$

$$= 30 \text{ mcg/ml}$$

690. (a) Creatinine clearance is the most common method for obtaining GFR.

$$Cl_{CR} = \frac{C_u \times V \times 100}{C_{CR} \times 1440}$$

where,

$$Cl_{CR} = \text{creatinine clearance in ml/min}$$

$$V = \text{24-hour urine volume}$$

$$C_u = \text{concentration of creatinine in urine}$$

$$C_{CR} = \text{creatinine serum concentration in mg/dL}$$

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SI ADH - water congection in the body
Krisman
diabetes insipidus - loss of water in great amount.

The concentration of creatinin in the urine is 100 mg/dL and 1 dL = 100 cc, therefore

100 cc contains 100 mg creatinin
1400 cc contains ?

$$= 1400 \times 100/100 = 1400 \text{ mg creatinin}$$

$$\begin{aligned} \text{Cl}_{\text{CR}} &= \frac{1400 \times 1400 \times 100}{2 \times 1440} \\ &= 68055 \text{ ml/day} \\ &= \frac{68055}{24 \times 60} \\ &= 47.26 \text{ ml/minute} \end{aligned}$$

691. (b) Indocin (Indomethacin) is classified as an NSAID. It is indicated for the treatment of ductus arteriosus in premature infants. It inhibits the synthesis of prostaglandins. It is also indicated for the treatment of pain associated with rheumatoid arthritis, spondylitis, acute gouty arthritis, and tendinitis. The recommended dose of the drug is 75 mg to 150 mg per day in divided doses. GI. ulcers, bleeding, nausea, and vomiting are reported side effects of the drug.

692. (d) Catecholamine induces hyperglycemia with the help of hepatic glycogen phosphorylase. This enzyme converts glycogen to glucose-1-phosphate, the rate limiting step in glycogenolysis. Glycogen synthase catalyses the transfer of glycosyl units from UDP-glucose to glycogen.

693. (a) Estradiol is the most potent and the major secretory product of the ovary. It is readily oxidized to estrone, which is then hydrated to estriol. This transformation takes place in the liver.

694. (d) Neonatal tetany may result from temporary transient hypoparathyroidism that occurs in newborns of mothers with hyperparathy-

roidism. It is usually transient and disappears as soon as the infant's parathyroid gland respond properly.

695. (b) Demeclocycline is effective in producing a water diuresis in patients with water intoxication due to inappropriate secretion of ADH. The recommended dose of drug is 600 to 1200 mg per day. It restores the concentration of Na⁺ plasma within 5 to 14 days.

696. (b) Lamprene (Clofazimine) is classified as a leprostatic agent. It is indicated for the treatment of leprosy. It has the longest half- life of about 70 days. Pink to brownish pigment of the skin, diarrhea, GI. bleeding, and pigmentation of conjunctiva and cornea are reported side effects of the drug. The recommended dose of the drug is 100 mg per day.

697. (b) The partial supply of Controlled II drugs should be filled within 72 hours from its initial filling.

698. (d) All. Fentanyl, Amphetamine and Methylphenidate are classified as schedule II controlled substances.

699. (c) The DEA requires that the inventory of Schedule II should be done every two years.

700. (b) The partial dispensing of Schedule III controlled drugs should be done within six months from its initial filling.

701. (b) Biaxin (Clarithromycin) oral suspension should not be refrigerated after reconstitution. After mixing, it should be stored between 15 to 30 C° and used within 14 days. The active ingredient of Biaxin is Clarithromycin. It should not be used by pregnant women except in clinical circumstances where no alternative therapy is appropriate. It can be taken with or without food. P.colitis is a principal side effect reported with the drug.

702. (a) Precose (Acarbose) may elevate the serum transaminase enzyme level when given in doses of 150 mg to 300 mg per day. Therapy should be monitored by regularly checking serum AST level.

703. (d) Zocor (Simvastatin), Mevacor (Lovastatin) and Pravachol (Pravastatin) are the HMG- COA reductase inhibitors.

The inhibition of HMG COA reductase enzyme prevents the conversion of HMG-COA to mevalonate, which is an early step in the synthesis of cholesterol.

It is recommended that liver function tests be performed before the initiation of therapy, and 2 to 3 months after initiation of therapy.

Lipitor (Atrovastatin) is a new HMG-COA reductase enzyme inhibitor. The recommended dose of Lipitor is 10 mg once a day. Mevacor, Zocor and Pravachol should be administered with an evening meal or at bed time, while Lipitor can be given any time of the day with or without food.

704. (a) Anafranil (Clomipramine) is generally indicated for the treatment of obsessive compulsive disorder of the brain. The recommended daily dose of drug is 50 to 100 mg per day.

Luvox (Fluvoxamine) has also been successfully used for treatment of OCD. The recommended daily dose of drug is 50 to 100 mg at bed time or in divided doses. Both of these drugs act through inhibition of the serotonin uptake in the brain.

SKR

705. (d)

706. (d) Toradol (Ketorolac) is classified as an NSAID. It is indicated for short-term management of pain. It is normally given by oral, I.V. or I.M. route. The maximum recommended daily dose of Toradol (Ketorolac) for oral administration is 40 mg/day, and for IV/IM administration it is 120 mg/day. It should not be used more than five days. G.I. ulcers, bleeding, and hepatic and

renal function impairment are reported adverse effects of the drug.

707. (c) Hydrogen peroxide is a common household oxidizing agent. It is not a good anti-septic for open wounds, but it is very useful in deep anaerobic wounds where the oxygen released by tissue-enzymes is highly effective against anaerobes such as clostridium.

708. (d) Nexium (Esomeprazole) is classified as proton pump inhibitor. It is an optical isomer of Prilosec (Omeprazole). It is indicated for treatment of Erosive esophagitis, GERD and H.pyroli.

The recommended therapeutic dose is 20 to 40 mg once a day for 4 to 8 weeks. It is available in a delayed release capsule in 20 and 40 mg oral strengths. Pancreatitis, liver necrosis, toxic epidermal necrolysis, constipation, flatulence and Stevens Johnson syndrome are reported side effects of the drug.

709. (b) Erythromycin is indicated for treatment of Legionnaires' disease caused by Legionella pneumophila.

710. (a) Talwin NX is generally indicated for the treatment of pain.

The active ingredients of Talwin NX are Pentazocine HCl and Naloxone HCl. It should never be given by I.V. or I.M. It can only be used orally. Naloxone HCL is an opioid antagonist and may produce acute narcotic withdrawal symptoms when given by I.M. or I.V. route. The oral dose of drug cannot produce such reactions since the amount of Naloxone may not be sufficient to produce opioid antagonist action.

711. (b) One of the active ingredients of Primidone is Phenobarbital, which may cause enzyme induction and increase the metabolism of Theophylline. Allopurinol, Cimetidine, Ciprofloxacin and Erythromycin have enzyme inhibition properties and may raise the serum concentration of the Theophylline.

712. (d) Zofran (Ondansetron), Kytril (Granisetron) and Anzemet (Dolasetron) are 5HT₃ receptor antagonists. All these drugs are indicated for prevention of nausea and vomiting associated with emetogenic cancer therapy. They are classified as 5-HT₃ antagonist.

The recommended daily dose for Zofran is (4 to 8mg), 1mg twice a day for Kytril, and 100 mg per day for Anzemet. Diarrhea, abdominal pain, clonic-tonic seizure, anaphylaxis and bronchospasm are reported side effects of the drug.

713. (c) Elixir contains 5 to 40% alcohol.

Diabinese (Chlorpropamide) is an oral sulfonylurea agent that produces Disulfiram-like reactions when used with alcohol. The symptoms of Disulfiram-like reactions are abdominal pain, abdominal cramps, nausea, vomiting, throbbing headaches, flushing and hypoglycemia.

714. (a) Microorganisms that establish permanent residence without producing disease are known as normal flora. Microorganisms that may present for a time and then disappear are called transient flora. Normal flora that can benefit the host by preventing the overgrowth of harmful microorganisms is called Microbial antagonism. Under certain conditions, when normal flora can produce harm to or disease in host cells, it is known as Opportunistic pathogens.

715. (d) Parnate (Tranylcypromine) is an MAO inhibitor indicated for treatment of depression. Effexor (Venlafaxine), Paxil (Paroxetine), Prozac (Fluoxetine), Zoloft (Sertraline) and Serzone (Nefazodone) are new classes of Antidepressant drugs.

Effexor is a potent reuptake inhibitor of neuronal serotonin and norepinephrine. It is available in 25 mg, 37.5 mg, 75 mg and 100 mg of oral strength.

Paxil (Paroxetine) is a potent inhibitor of neuronal reuptake of serotonin (5-HT). It is available in 10 mg, 20 mg, 30 mg and 40 mg of oral strength.

Prozac (Fluoxetine) generally inhibits the reuptake of neuronal serotonin. It is available in 10 mg and 20 mg of oral strength. It is available in liquid, oral pulvules and tablet form.

Zoloft is a potent reuptake inhibitor of serotonin. It is available in 25 mg, 50 mg and 100 mg of oral strength.

* MAO inhibitors inhibit the metabolism of epinephrine, norepinephrine and dopamine. This increases the availability of neurotransmitters to neurons that may help in depression. It may require 3 to 4 weeks to obtain full therapeutic effects. MAO inhibitors should be carefully used with OTC cough and cold medicines. Because of insomnia and sleep disturbances, MAO inhibitors should not be taken in the evening or late in afternoon.

Orthostatic hypotension may be reported with MAO inhibitor therapy. MAO inhibitors should be contraindicated in patients with pheochromocytoma.

The most dangerous adverse effect associated with the use of MAO inhibitors is hypertensive crisis. Frequent headaches and palpitation are early signs of hypertensive crisis. Discontinue therapy and consult a physician immediately upon observing the above symptoms.

Allow at least 5 weeks before initiating MAO inhibitors and discontinuing Fluoxetine therapy, and allow at least 14 days before initiating MAO inhibitors and discontinuing TCA therapy to prevent hypertensive crisis.

716. (b) Otitis media is generally caused by H. influenza and S. Pneumonia.

717. (c) Otitis externa is generally caused by P.aeruginosa. Pseudomonas, particularly P. aeruginosa, may cause opportunistic skin infections. They are normally present in soil, water,

and plants. Otitis externa or swimmer's ear is a pseudomonad infection of the outer ear. Gentamicin and carbenicillin are effective antibacterial agents.

718. (c) The patch should be placed on a clean, dry area of skin or the trunk of the body. Sites selected should not be exposed to sunlight. It should never be applied to the breast. The application site should be rotated every week. The patch should not be applied to the waistline since tight clothing may rub off the system. The system should be applied immediately after opening.

719.(a) Videx (Didanosine) has a prolonged duration of action compared to Retrovir, and has the least bone marrow suppression properties. The percentage of patients surviving is less with Videx than Retrovir.

Videx is easily degraded in acidic media. All Videx formulation should be administered at least 30 minutes before a meal. Adequate buffering is required to prevent gastric acid degradation of Didanosine. (For example If patient is taking a 100 mg dose, than he has to take two tablets of 50 mg instead of 1 tablet of 100 mg.) Each tablet of Videx is buffered with CaCO₃ and MgO.

720. (a) Cold sores or fever blister is normally caused by HSV-1 (herpes Simplex Virus type-1).

721. (c) Sulfonamide causes hemolytic anemia in patients with G6PD deficiency.

722. (d) Trachoma is normally caused by Chlamydia trachomatis. It is the leading cause of blindness in the world. It is an infection of the epithelial cells of the eyes. Scar tissues form on the cornea. Tetracycline is indicated for the treatment.

723. (b) Mephyton (Vitamin K1, Phyttonadione) is generally prescribed to patients with vitamin K deficiency. It is available in 5 mg of oral strength.

Parenteral form of Mephyton is available in 5mg/cc and 10mg/2cc. The parenteral form is available as an aqueous colloidal solution of vitamin K1 known as AquaMEPHYTON. Severe reaction including fatalities have been reported during I.V. administration of vitamin K1, and therefore the intravenous route should be restricted to those situations when therapy with another route is not possible.

The vitamin K1 is generally indicated for the treatment of hypoprothrombinemia associated with antibacterial therapy, coumadin therapy or diseases such as cystic fibrosis, ulcerative colitis, jaundice or biliary fistula, where synthesis or absorption of vitamin K1 is limited.

The recommended initial dose of vitamin K1 is 2.5 to 10 mg. Patients may be titrated up to a 50 mg dose. Chromagen and Niferex-150 are available as iron supplements. Mestinon (Pyridostigmine) is an antidote for Neuromuscular blockers.

Ergocalciferol is a Vitamin D₂ analog. It is generally indicated for the treatment of rickettsia, hypophosphatemia and hypoparathyroidism.

724. (d) The patients is hypersensitive to Pentazocine. Talacen (Pentazocine + APAP), Talwin comp (Pentazocine + Aspirin) and Talwin NX (Pentazocine + Naloxone) contain Pentazocine as an active ingredient and need to be avoided by the above patients.

725. (a) Pancrelipase enzyme preparations may help in the conversion of complex carbohydrates to glucose. Thus they reduce the effect of Acarbose.

726. (d) Toradol may reversibly inhibit the aggregation of platelets. Plicamycin, Valproic acid, Cefotetan, Cefoperazone and Moxalactam have been reported to inhibit the aggregation of platelets. The concurrent use of these agents with Ketorolac may increase the risk of bleeding.

727. (d) Cozaar (Losartan K⁺), Diovan (Valsartan) and Avapro (Irbersertan) are Angiotensin II receptor antagonists. They rarely produce cough and angioedema, which is a common problem with Angiotensin Converting Enzyme Inhibitors. Irbersertan and Valsartan may be administered with or without food. They are indicated for the treatment of hypertension. Hyperkalemia is commonly reported side effects of these drugs.

728. (b) Infectious mononucleosis is caused by Epstein Barr virus. It is characterized by enlarged and tender lymph nodes, enlarged spleens, fever, sore throat and headache. It is most commonly spread by an infected patient's saliva. As a result of infection, white blood cells proliferate in the same manner as in leukemia. Chronic Fatigue Syndrome is also reported with Epstein Barr virus.

729. (b) Imipramine is TCA mainly indicated for the treatment of nocturnal enuresis. The M/A of TCA in the treatment of nocturnal enuresis has been questioned. Desmopressin (Vasopressin) is a synthetic analog of endogenous human antidiuretic hormone also indicated for the treatment of nocturnal enuresis.

Vasopressin produces its effect via V₂ receptors present in a renal collecting duct. When Vasopressin binds to a V₂ receptor, it stimulates the exocytosis of water channel containing vesicles in apical membrane, and decreases endocytosis from apical membrane which helps in the reduction of urine volume.

Desmopressin decreases the production of urine within 1 to 2 hours of administration and its duration of action lasts up to 12 to 16 hours.

730. (c) Corlopan (Feoldopam) is indicated for short-term (up to 48 hours) management of severe hypertension when rapid but quickly reversible, emergency reduction of blood pressure is clinically required. It is an agonist for Dopamine-D1 receptors.

731. (d) Deferoxamine mesylate can be administered by I.V., I.M, or subcutaneously. Desferal chelates with iron and forms a stable complex, which then prevents the iron from proceeding in further chemical reactions. Generally, 100 parts of Desferal is capable of binding to approximately 8.5 parts of Fe⁺³ ion. The chelates are readily soluble in water and pass easily through the kidney. Urine may discolor to a reddish brown.

732. (d) Reglan (Metoclopramide) is available in tablet, syrup and injection form. It produces its antiemetic action by inhibiting stimulation of the chemoreceptor trigger zone, which is responsible for producing nausea and vomiting. It also enhances the rate of GI. emptying and increases the GI. motility. Because of its enhanced GI. emptying property, it reduces the absorption of a number of drugs.

733. (c) Burkitt's lymphoma is caused by Epstein Barr virus.

734. (d) Status epilepticus is characterized by rapid and frequent repetition of tonic clonic seizure. This life threatening condition may extend up to hours or days. Dextrose 50% solution, Diazepam, Phenytoin and Phenobarbital are drugs of choice during acute attacks of status epilepticus.

735. (d) Tigan (Trimethobenzamide) is generally indicated for control of nausea and vomiting. It is available in suppository, injection and capsule forms. Tigan is available in 100 and 250 mg capsule strength. Tigan is also available in 100 mg suppository strength.

Tigan may inhibit the stimulation of chemoreceptor trigger zones which generally transfer impulses to the vomiting center. It should be avoided in children whose signs and symptoms represent Reye's syndrome. No AB and AT rating is listed for Tigan.

736. (a) Vibramycin (Doxycycline) can be more safely used in patients with impaired renal function compared to other derivatives of Tetracycline. It can be taken with food, antacids, and milk and dairy products. It is indicated for the treatment of uncomplicated gonococcal infections and syphilis. It is also used as a prophylaxis in malaria and traveler's diarrhea. The recommended dose of the drug is 100 mg b.i.d for 10 to 14 days. It is not indicated for treatment of systematic antidiuretic hormone deficiency. Demeclocycline is indicated for treatment of SAIDH (Systematic Antidiuretic Hormone Deficiency).

737. (c) Ultraviolet rays in the range of 280 to 310 nm are generally responsible for causing sunburn reaction and sun tan. Any sunscreen product that covers 280 to 310 nm of UV range may help in the prevention of sunburn reaction and tanning.

738. (a) Sinoatrial node (SA node) is known as the pacemaker of the heart. It generates nerve impulses that spread to the atrioventricular node (AV node), where the impulses are amplified and spread to other regions of the heart by nerves called Purkinje fibers.

739(d) Zofran (Ondansetron HCl) is classified as antiemetic agent. It is a 5HT₃ antagonist. It is available in tablet, injection and oral

solution for treatment of cancer chemotherapy-induced nausea and vomiting. It is available in 4 mg and 8 mg of oral strengths. The recommended dose of drug is 8 mg b.i.d.

740. (c) Vasopressin (ADH) and oxytocin are secreted by the posterior pituitary gland. Vasopressin stimulates water resorption in the kidney, where as oxytocin stimulates the contraction of uterus muscles during birth.

741. (c) Albumin is a major plasma protein involved in protein binding of drugs. Protein binding is a dynamic process in which there is an equilibrium between bound and unbound drugs. The bound drug is physically inactive. The concentration of unbound drug or free drug is mainly responsible for pharmacological actions. Protein binding serves as a drug reservoir and releases the drug when needed. The other serum proteins such as alpha-1 acid glycoprotein, lipoprotein, and transcortin play a small role in the binding of drugs.

742. (b) Fluticasone and Salmeterol are the active ingredients of Advair Diskus. It should not be used more frequently than 2 times daily, morning and evening, approximately 12 hours apart, at the recommended dose of 1 inhalation each time. It is available in three different strengths 100 mcg Fluticasone and 50 mcg Salmeterol, 250 mcg Fluticasone and 50 mcg Salmeterol, and 500 mcg Fluticasone and 50 mcg Salmeterol. It should not be used to treat acute attacks of asthma.

743. (d) Cotazym, Pancrease, Zymase and Donnazyme are pancrelipase enzyme supplements that contain lipase, protease and amylase. Pulmozyme is mainly indicated for the treatment of cystic fibrosis. Pulmozyme (Dornase Alpha) is a purified solution of recombinant human deoxyribonuclease, an enzyme that is selectively cleaved DNA.

In cystic fibrosis patients, retention of viscous purulent secretion contributes to both reduced pulmonary function and exacerbation of

infection. Pulmonary secretion of cystic fibrosis patients contains a large amount of extracellular DNA (released by degeneration of leukocytes).

Pulmozyme cleaved this DNA and reduces the viscosity of sputum.

Viokase, Ultrase and Creon are pancrelipase enzyme supplements. These all contain standardized lipase, protease and amylase. These natural digestive enzymes help in hydrolyzing fats in fatty acid and glycerol, splitting proteins in aminoacids.

744. (d) Famvir is generally indicated for treatment of viral disease. *S. Aureus* is a bacterial organism, *C. albican* is a fungal organism, *M. lepre* is a bacterial agent that generally causes leprosy, and *Cl. perfinger* is an anaerobic organism. Only *H. zoster* is a viral agent. It generally produces herpes zoster.

745. (b) The active ingredient of Pentam-300 is Pentamidine isethionate. It is mainly indicated for treatment of *P. Carini*. Severe hypotension will be observed when Pentam given by I.M. or I.V. routes. The prescription of Pentam cannot be filled by Nebu Pent since it is an inhalation product of Pentamidine, taken by Respiguard II nebulizer.

Patients receiving Pentam-300 should be lying down during the therapy, and blood pressure should be monitored from time to time during and after completion of therapy.

746. (d) Pentasa (Mesalamine) is a 5-acetylsalicylic acid derivative. It is indicated for the treatment of ulcerative colitis. It is chemically related to acetylsalicylic acid. It inhibits cyclo-oxygenase enzymes and prostaglandin synthesis. Anaphylaxis, diarrhea, abdominal cramps, and GI. ulcers and bleeding are reported side effects of the drug. The recommended dose of the drug is 1 gram q.i.d. It produces its anti-inflammatory action by inhibiting synthesis of prostaglandins.

747. (b) A normal therapeutic range of prothrombin time is 12 to 15 seconds.

748. (c) The body mass index can be calculated by dividing weight (kg) by height (meter)².

749(a) Phenobarbital is a weak acid. Administration of NaHCO_3 makes urine alkaline and increases the ionize form of Phenobarbital. Ionization of drug molecules will result in a reduction of reabsorption of the drug from the renal tubules.

Alkalinization of urine is one of the ways to reduce Phenobarbital toxicity in cases of Phenobarbital overdose.

750. (a) Kaletra is a combination product of Lopinavir and Ritonavir. It is indicated for treatment of AIDS. The recommended therapeutic dose of drug is three capsules twice a day with food. Its oral solution contains alcohol and should be avoided with drugs that may produce disulfiram-like reactions with alcohol. It has a profound enzyme inhibition property and should be carefully prescribed with other drugs. Rifabutin doses should be reduced by 75% from the recommended initial dose.

751. (a) Severe headaches are commonly reported with Nitroglycerine, Isosorbide dinitrate and Terbutaline therapy.

752. (b) Posicor (Mibefradil HCl) is indicated for the treatment of hypertension or chronic stable angina pectoris. The recommended dose of Posicor is 50 mg to 100 mg once a day.

753.(d) The active ingredient of Accolate is Zafirlukast. It is a synthetic selective peptide Leukotriene Receptor Antagonist (LTRA) of Leukotriene D_2 and E_4 . It is available in 20 mg of oral strength. It is not a bronchodilator and should not be used for treatment of acute attacks of asthma. Diarrhea and pulmonary angitis are reported side effects of the drug.

Zyflo (Zileuton) is a new drug indicated for chronic and prophylaxis treatment of asthma. It is a specific inhibitor of 5 Lipooxygenase enzyme which is responsible for formation of LTB_4 , LTC_4 , LTD_4 and LTE_4 . It is available in 300 mg and 600 mg of oral strength. Liver toxicity, arthralgia, myalgia, dyspepsia, constipation and flatulence are reported side effects of the drug.

Take Accolate 1 to 2 hours prior to meals. Accolate and Zyflo are not indicated for children less than 12 years of age.

754. (d) Imuran (Azathioprine), Neoral (Cyclosporine), Sandimmune (Cyclosporine) and Rho Gam (Rho_D - Immune Globulin) are immunosuppressive agents useful in organ transplantation. Zemuron (Recuronium Br) is a neuromuscular blocking agent.

755. (b) Beta-blockers and diuretics are first line agents for treatment of hypertension, while Ace inhibitors and Ca- channel blockers are second line agents for treatment of hypertension.

756. (d) Cozaar (Losartan K⁺) is a new antihypertensive drug with Angiotensin II receptor antagonist properties. It selectively blocks the binding of Angiotensin II to the AT- receptor. Angiotensin II has a powerful vasoconstriction property. It is available in 25 mg and 50 mg of oral strength. The recommended dose of Cozaar in the treatment of hypertension is 25 to 50 mg per day. Hyzaar is a combination product of Losartan and Hydrochlorothiazide.

Angiotensin II receptor antagonists are devoid of side effects such as a dry hacking cough and angioedema. The other new Angiotensin type II receptor antagonists are Avapro (Irbersertan) and Diovan (Valsartan).

757. (a) SPF is defined as the minimum erythral dose of protected skin divided by the minimum erythral dose of unprotected skin. A woman who develops chest redness after run-

ning 30 minutes in the sun, and wants to stay for 3 hours (180 min) in sun, should apply a sunscreen product with an SPF of 6 (180 min /30 min = 6).

Sunscreen products with SPF=6 provide adequate protection against U.V. light rays. The sunscreen products with SPF=15 provide 93% protection against U.V. light; SPF more than 15 does not provide any additional advantage.

758. (c) Cancidas (Caspofungin) is classified as an antifungal agent. It inhibits the synthesis of D-glucan, an essential component of the cell wall of susceptible fungi. It is indicated for the treatment of infections caused by *Aspergillus* fungi. The recommended therapeutic dose of the drug is a single 70 mg loading dose administered on day 1, followed by 50 mg once daily thereafter. Fever, chills, flu-like symptoms, rash, and pruritus are reported side effects of the drug.

759. (d) The chances of hypoglycemia is lower when the patient is on Precose (Acarbose), Glucophage (Metformin) or Rezulin (Troglitazone), since hypoglycemia is generally associated with excessive secretion of insulin rather than a low intake of glucose.

Rezulin improves insulin sensitivity (not the insulin secretion) in skeletal muscles and adipose tissues, and inhibits the hepatic glucose production.

All these agents do not stimulate the secretion of insulin from the pancreas, but help in control of blood glucose levels either by increasing the sensitivity of tissue towards its own insulin, or by prolonging process of glucose production.

Rezulin unlocks the insulin resistance while Glucophage increases the sensitivity of tissues towards its own insulin. Precose may prolong the blood glucose formation by inhibiting key enzymes that are responsible for production of glucose.

760. (d) Metamucil (Psyllium), Citrucel (Methyl cellulose) and Mitrolan (Calcium Polycarbophil) are bulk-forming laxatives.

761. (d) Protonix (Pantoprazole) is classified as proton pump inhibitor. It is indicated for the treatment of erosive esophagitis and GERD. The recommended dose of the drug is 40 mg per day. Diarrhea, flatulence, abdominal pain and arthralgia are reported side effects of the drug.

762. (d) Questran (Cholestyramine) and Colestipol (Colestid) may reduce the absorption of Troglitazone by 70%.

Coadministration of Rezulin (Troglitazone) with Terfenadine may reduce the serum concentration of Terfenadine, as well as Fexofenadine (the active metabolite of Terfenadine) and their pharmacological effects.

Rezulin can be taken with a meal. Tablets of Rezulin should not be broken as potency is lost when exposed to moisture.

763. (d) Nizoral may raise the serum concentration of Hismanal (Astemizole), Seldane (Terfenadine), Claritin (Loratadine) and Propulsid (Cisapride).

The elevation of serum concentration of these drugs would lead to cardiac arrhythmia and cardiac toxicity. Concurrent use of the above drugs with Nizoral may require close monitoring of cardiac functions of patients.

764. (b) NSAIDs are used for analgesia, dysmenorrhea and brunitis. G.I. ulceration and bleeding have been reported with the use of NSAID. Any OTC NSAID should not be used more than 3 days for fever or 7 days for pain.

765. (d) Lovenox (Enoxaprine Na) is low molecular weight heparin containing 30 mg of Enoxaprine Na in 0.3 ml of S.W.F.I. It is mainly indicated for prevention of deep vein thrombosis, which leads to pulmonary embolism following hip or knee replacement surgery.

Lovenox should be carefully used in patients with hypersensitivity to heparin or in patients with heparin induced thrombocytopenia. Elevation of serum transaminase levels would be associated with Lovenox therapy. Since elevation of AST is a very important factor for diagnosis of myocardial infarction, liver disease and pulmonary embolism, the results should be interpreted with caution.

766. (b) Cylert (Pemoline) therapy is associated with life threatening hepatic failure. Treatment with this drug should be initiated only in individuals without liver disease. Serum ALT (SGPT) should be checked on a regular basis.

Cylert (Pemoline) is indicated for treatment of Attention Deficit Hyperactivity Disorder. The recommended dose of the drug is 37.5 mg per day.

767. (b) Gabitril (Tiagabine) is classified as antiepileptic agent. It is indicated for treatment of partial seizures. It increases the activity of GABA, which is a major neurotransmitter in the central nervous system. The therapy should be initiated with 4 mg daily and can be increased up to 32 mg per day until clinical response is achieved. Dizziness, asthenia, somnolence, nystagmus, ataxia, confusion and speech disorder are reported side effects of the drug.

768. (b) The active ingredients of Combivent inhalers are Albuterol sulfate and Ipratropium Br. It is indicated for the treatment of asthma.

769. (b) Cozaar (Losartan) and Avapro (Irbesartan) are Angiotensin type II receptor antagonists.

770. (d) Insulin Aspart Recombinant (Novolog) is a human insulin analog. It has a faster onset of action and a shorter duration of action than regular human insulin. Due to its fast onset of action, it should be given immediately after a meal. Hypoglycemia is a common side effect of the drug.

771. (c) A dose of folic acid greater than 0.4 mg per day is strictly prohibited in OTC vitamins, and requires a prescription to purchase the drug.

The reason for limiting the dose of folic acid in OTC products is to prevent a neurological complications. An MCV value greater than 100 indicates that a patient is suffering from either vitamin 12 deficiency anemia or folic acid deficiency anemia. Folic acid would correct the anemia but it would not correct the vitamin B12 deficiency, which may lead to severe neurogenic complications. Folic acid should never be given until the diagnosis of pernicious anemia has been ruled out.

772. (d) Before initiating therapy with Taxol (Paclitaxel), the patient needs to be pretreated with corticosteroid, diphenhydramine, or H_2 receptor antagonists to prevent the hypersensitivity reactions that are generally associated with the use of Taxol.

Paclitaxel is classified as an antineoplastic agent. It is indicated for the treatment of breast cancer, metastatic carcinoma of the ovary, and kaposi's sarcoma. Complete AV block, syncope, angioedema, and dyspnea are reported side effects of the drug.

773. (d) Antihistamines, nasal decongestants and parasympatholytic drugs should be avoided by patients suffering from B.P.H. The anticholinergic effect of antihistamines and parasympatholytics may worsen the symptoms of B.P.H. by precipitating urinary retention. Stimulation of alpha-1 receptors by nasal decongestants may antagonize the action of alpha-1 blockers and reduce the therapeutic effects of drugs.

774. (b) Imitrex (Sumatriptan) is indicated for treatment of migraines. It is an agonist of a vascular 5- HT receptor.

It is available in tablet and injection form. Tablets are available in 25 mg and 50 mg of oral strength. Injections are available in 0.5ml/6mg of strength in prefilled syringes and vials.

At the onset of attack, patients may take 25 to 100 mg by mouth and then may repeat every 2 hours if needed. (**not to exceed a daily dose of more than 300 mg **). Alternatively, patients can take 6mg S.C. The maximum recommended dose is 12mg/day with an interval of 1 hour between two injections.

Serious life threatening arrhythmia, myocardial infarction, and heart failure are reported side effects of the drug. It should be carefully prescribed in patients with a history of ischemic heart disease, myocardial infarction, hypertension, and angina.

775. (c) Methicillin resistant infection should be treated by Vancomycin HCl. Vancomycin is poorly absorbed after oral administration, therefore parenteral route is generally more preferable compared to oral route for treatment of systematic infection.

It is given intravenously for treatment of systematic infection. It is mainly indicated for treatment of serious or severe infection caused by the susceptible strains of Methicillin resistant staphylococci and endocarditis. Vancomycin oral solution and pulvules are indicated for treatment of colitis. They must be given orally for treatment of S. enterocolitis and antibiotic-associated P. Colitis caused by Cl. difficile. Parenteral preparations must not be used for treatment of P. colitis.

776. (b) Diabetes is the leading cause of renal failure in the world. Vasotec (Enalapril) or any other Ace Inhibitor reduces the risk of renal insufficiency by 50% and ends point death associated with diabetes.

777. (c) The active ingredient of compound W is 17% salicylic acid. It is indicated for removing warts.

778. (b) Synophylate (Theophylline Na glycinate elixir) and Elixophyllin (Theophylline elixir) contain 10 to 40% of alcohol and should be avoided with Antabuse (Disulfiram) to prevent disulfiram-like reactions.

779. (d) Elavil (Amitriptyline) is classified as a tricyclic antidepressant. It has the highest sedation property among all the antidepressant agents and may be more preferable to use for treatment of depression with anxiety disorder. The recommended dose of the drug is 75 mg to 150 mg at bed time. Anticholinergic side effects such as dryness of mouth, constipation, blurred vision and urinary retention are reported with the drug.

780. (c) Fluoxetine (Prozac) is a potent and selective inhibitor of 5 HT uptake, but not of norepinephrine. It is available in 10 mg and 20 mg of oral strength. It should be carefully used with MAO inhibitors.

781. (b) Zofran (Ondansetron HCl) is mainly indicated for prevention of nausea and vomiting associated with emetogenic cancer chemotherapy. It is a selective 5HT₃ receptor antagonist. It is also available in injection form. The recommended dose of Zofran is 8 mg by mouth twice a day.

782. (a) Gold-compound (Auranofin), Methotrexate and Probenecid may increase the risk of nephrotoxicity when used simultaneously with Toradol (Ketorolac). Concurrent use may not be recommended. Concurrent use of Cefotan (Cefotetan) with Toradol (Ketorolac) may aggravate the bleeding tendency of patients by inhibiting aggregation of platelets. Concurrent use may require close supervision.

783. (b) Erythropoietin is secreted by the kidney in response to a reduction in the amount of oxygen that reaches tissues. It increases the rate of production of RBC by the process of erythropoiesis. The production of red blood cells normally occurs in the blood forming tissues of bone marrow.

784. (a) Carbamazepine is indicated for the relief of pain due to trigeminal neuralgia and glossopharyngeal neuralgia.

It is structurally related to Tricyclic Antidepressant and should be carefully used in patients with TCA allergy. It is also used for alcohol withdrawal treatment. It rapidly relieves anxiety and distress in acute alcohol withdrawal treatment.

It is indicated for treatment of partial and grand mal seizures.

For the treatment of simple and grand mal seizures, Dilantin (Phenytoin), Phenobarbital and Primidone (Mysoline) are generally used. For the treatment of absence seizure, Ethosuximide (Zarontin), Depakote and Depakene (Valproic acid) are commonly used.

785. (d) Erythromycin is generally indicated for the treatment of Legionnaires' disease caused by Legionella pneumophila. It is also indicated for the treatment of mycoplasma pneumonia and campylobacterial infection.

786. (d) Atromid is an antihyperlipidemic drug, not in the class of HMG-COA reductase enzyme inhibitors. It is a fibric acid derivative. The active ingredient of Atromid is Clofibrate. It helps in the control of elevated lipid levels by:

1. Inhibition of biosynthesis of cholesterol before mevalonate formation.
2. Increasing the catabolism of VLDL.

It is recommended to take the drug with food to minimize G.I. upset. The usual dose of Atromid is 1.5 to 2.0 gm per day in 2 to 4 divided doses.

787. (c) These symptoms indicate dystonic reaction, which involves sudden spasms of necks, face or trunk. Dystonic reaction can be managed by anticholinergic agents like Diphenhydramine or Benztropine. For the treatment of akathisia, Diazepam and anticholinergic agents are usually preferable. For the treatment of drug-induced Parkinson's, anticholinergic drugs have been found effective.

788. (d) Ilosone (Erythromycin Estolate) is the preferred erythromycin to use in children because of its better absorption in the presence of food, and better G.I. tolerance compared to other erythromycin salts. Ilosone (Erythromycin estolate) is highly hepatotoxic and responsible for causing cholestatic hepatitis.

789. (a) PGD_2 is a potent mediator of asthma attacks, while prostaglandin PGF_2 and PGI_2 are bronchioprotective. The other mediators released during attacks are leukotriene, histamine, chymotrypsin and trypsin, responsible for causing early asthma symptoms. These mediators are responsible for airway edema, mucus production and bronchoconstriction.

790. (a) The purity of Insulin can be measured by the content of Proinsulin.

791. (a) For the treatment of hyperthyroidism, Propylthiouracil, Methimazole and radioactive Iodine are appropriate of drugs. Propylthiouracil is more preferable over KI and Methimazole in the treatment of hyperthyroidism in pregnant women, because of the low risk of the drug transferring to the placenta. Additionally, it prevents peripheral deiodination of T4 to T3. It has a low adverse effects profile compared to Methimazole. Methimazole may produce agranulocytosis, thrombocytopenia and agranulocytopenia, however it has a prolonged duration of action compare to Propylthiouracil and is generally

given in once daily dosing. Propylthiouracil is available in 50 mg of oral strength, while Methimazole (Tapazole) is available in 5 mg and 10 mg of oral strength. The recommended daily dose of PTU is 100 to 150 mg three times a day, while that of Methimazole is 30 to 45 mg per day.

792. (c) Parlodel (Bromocriptine) and Permax (Pergolide Mesylate) are dopamine receptor agonists. Parnate (Tranlycypromine) is an MAO_A inhibitor useful in treatment of depression.

793. (d) Thiazide-diuretic, phenothiazine, tetracycline and sulfonamide may increase the sunlight sensitivity of skin. Patients who are taking these drugs for a prolonged period of time need to avoid sunlight.

794. (b) Histamine is a compound derived from amino acid Histidine. It is normally associated with mast cells. It causes contraction of smooth muscles and dilation of blood vessels. It increases the force of contraction and rate of the heart. It also stimulates gastric acid, and salivary and pancreatic secretions. It is released in large amounts after skin damage.

795. (b) The normal therapeutic blood serum concentration of Dilantin (Phenytoin) is 10 to 20 mcg/ml. A 20 mcg/ml concentration generally precipitates out nystagmus, 30 mcg/ml may produce ataxia and 40 mcg/ml produces lethargy and dysarthria. It is indicated for the treatment of tonic-clonic seizure. the recommended dose of the drug is 300 to 400 mg per day in divided dosing.

796. (d) Lipoatrophy is mainly associated with the use of insulin. It is recommended to rotate the injection site to avoid lipoatrophy. Diarrhea, abdominal pain, stomatitis and proteinuria are the adverse effects reported with use of gold compounds.

797. (d) Zyrtec (Cetirizine), Seldane (Terfenadine) and Hismanal (Astemizole) are nonsedative antihistamines. These agents should be avoided with Erythromycin, Ketoconazole, Clarithromycin and Propulsid because of a property which inhibits the metabolism of these antihistamines. Elevation of blood concentration of these antihistamines may result in severe cardiac toxicity and tachycardia.

798. (d) The minimum weighable quantity for a class A prescription balance is 120 mg.

799. (d) Zyban, Wellbutrin (Bupropion HCl) is classified as antidepressant. It is indicated for the treatment of depression. It also helps to reduce the urge to smoke. It is presumed to act on a dopaminergic and noradrenergic pathway involved in nicotine addiction and withdrawal. It also helps to reduce nicotine withdrawal symptoms. Seizure is the principal side effect of the drug. It is contraindicated for patients with MAO inhibitors. Dosing should begin at 150 mg/day for the first 3 days, and then increases to 300 mg/day. The total daily dose of Zyban should not exceed more than 300 mg and should be administered in two divided doses.

800. (b) Rezulin (Troglitazone) is mainly indicated for the treatment of Type II Diabetes mellitus. It is the first new class of Thiazolidinedione agents. It is available in 200 and 400 mg of oral strength.

For management of Type II diabetes, diet control, calorie restriction, weight loss and exercise are essential factors. Rezulin improves the insulin sensitivity in skeletal muscles and adipose tissues and inhibits the glucose production in the liver. It is mainly indicated for use in insulin treated type II diabetes, where the use of more than 30 units of Insulin per day is still not able to produce adequate diabetic control. It should be carefully used in patients with impaired liver function.

801. (d) Verapamil has powerful AV node suppression properties. Concurrent use with any Beta-blocker may result in additive AV node suppression properties. Concurrent use of Calcium supplements like Oscal may elevate serum calcium concentrations and reduce the therapeutic effect of Verapamil. Concurrent use of Digoxin with Verapamil has been reported to increase the serum concentration of Digoxin and its toxicity. Disopyramide should not be administered within 48 hours of Verapamil administration, since both medications have high negative inotropic effects on the heart.

802. (b) Arlex (Loteprednol) is a federally approved agent that is indicated for treatment of allergic conjunctivitis. Prolonged use of steroids may increase the intraocular pressure of the eyes. It should be used for a short-term only.

803. (d) Platelets (Thrombocytes) are disk-shaped cells, 1 to 2 micrometers in diameter. They are present in the blood. Their major function is to clot the blood. The deficiency of these cells may result in bleeding. The normal count of these cells in blood is 150,000 to 400,000 mm^3 .

804. (d) The major side effect of all these drugs is pulmonary dysfunction. It would be necessary to monitor patients for pulmonary function when he/she is on Bleomycin, Parlodel (Bromocriptine) or Pentam (Pentamidine) therapy.

805. (c) Nimotop (Nimodipine) is classified as a calcium channel blocker. It is indicated for the treatment of cerebral spasm following subarachnoid hemorrhage. It has a high lipid solubility which facilitates drug entry in the brain. Hypotension, tachycardia, peripheral edema and GI hemorrhage are reported side effects of the drug. The recommended dose of the drug is 60 mg every 4 hours, beginning within 96 hours after subarachnoid hemorrhage, for 21 consecutive days.

806. (b) Reye's syndrome is associated with nausea and vomiting. Tigan (Trimethobenzamide) is classified as antiemetic agent. It may mask symptoms and prolong the diagnosis of Reye's syndrome in children.

807. (d) All. Questran (Cholestyramine), Colestid (Colestipol) and Welchol (Colesevelam) are bile acid-binding resins indicated as an adjunctive therapy to diet and exercise for the reduction of elevated lipid level. The recommended therapeutic dose of drug is three tablets twice a day with meals, or 6 tablets once daily with a meal. The most frequently reported side effects are constipation, dyspepsia and flatulence.

808. (b) Multiple sclerosis is a chronic disease of the nervous system affecting young and middle age adults. The myelin sheath surrounding nerves in the brain and spinal cord are damaged. The disease affects different parts of the brain and spinal cord resulting in typically scattered symptoms. These include ataxia, nystagmus, dysarthria, and optic neuritis.

809. (c) Duragesic (Fentanyl) Transdermal system is available in 25, 50, 75 and 100 mcg/hr strength. It should be changed every 3 days. The initial recommended dose of drug is 25 mcg/hour. The dose can be gradually increased. It should not be administered to children under age 12 or in patients under age 18 whose weight is less than 110 lbs. Serious life threatening hypoventilation has been reported with a high dose of Duragesic TDS.

810. (d) All. Furosemide is available in tablet, oral solution and injection form. It is classified as loop diuretic. It is indicated for the treatment of edema associated with CHF, nephrotic syndrome and hepatic cirrhosis. The recommended dose of the drug is 40 mg to 80 mg per day. Hypokalemia and electrolyte loss are reported side effects of the drug.

811. (c) Diflunisal (Dolobid) is a pro-drug. Prodrug means a drug is active after its metabolism. It is classified as NSAID. All NSAIDs cause ulcers and G.I. bleeding. It is indicated for the treatment of pain. The therapeutic recommended dose of Diflunisal is 500 mg to 1000 mg per day.

812. (a) It generally increases the concentration of GABA. It is an inhibitory neurotransmitter, so by increasing the concentration of GABA antiepileptic action is produced. It is available under Depakote, Depakene and Depakote sprinkle brand names. It is available in 125 mg, 250 mg and 500 mg of oral strength. The major adverse effects reported with Valproic acid are hypoprothrombinemia and hepatotoxicity. It is generally considered as a drug of choice for all kinds of epilepsy.

813. (d) Category X indicates the highest risk to the developing fetus. The following is the summary of highest risk category to the lowest risk category to the developing fetus.

X>D>C>B>A

(A) Includes the list of drugs that have been shown as the least risk to the developing fetus.

814. (d) Ativan (Lorazepam) injection reduces the severity and duration of nausea and vomiting associated with emetogenic cancer therapy. Chlordiazepoxide (Librium), Clorazepate (Tranxene), Diazepam (Valium) and Oxazepam (Serax) are indicated for the relief of acute alcohol withdrawal symptoms such as agitation, tremor, impending and acute delirium.

815. (c) The pineal gland is a pea-sized gland located at the posterior wall of the third ventricle of the brain, deep between the cerebral hemispheres at the back of the skull. It mainly secretes Melatonin. It is the hormone that regulates day/night cycle.

816. (d) A patient has "High Cholesterol" if his total serum cholesterol value is greater than 240mg/dl.

817. (b) Hytrin (Terazosin) is an alpha-1 blocker. It is indicated for treatment of BPH and hypertension. The first dose syncope is a major side effect of the drug. The recommended dose of the drug is 5 mg to 10 mg per day.

818. (b) Carbamazepine and Cyclobenzaprine are structurally related to TCA. They should be carefully prescribed to patients who have hypersensitivity reaction with any TCA.

819. (d) The presence of ketone bodies in urine is defined as ketonuria or acetonuria. It is normally seen in patients with diabetes mellitus. It is also reported in patients after prolonged starvation or severe vomiting. Ketone bodies may be detected by adding a few drops of 5% sodium nitroprusside solution and ammonia solution to the urine; the gradual development of a purplish red color indicates their presence.

820. (d) Gingival hyperplasia is the major side effect of Dilantin (Phenytoin). It refers to bleeding from and enlargement of the gums. The symptoms usually begin to appear within 24 weeks from the initiation of therapy. It may cause gingivitis or inflammation of the gums. The chances of gingivitis are higher in younger rather than in older patients. Lupus erythematosus and ataxia have been reported with the treatment of Dilantin.

821. (c) Thiazide diuretic causes hypokalemia and hyponatremia by enhancing urinary excretion of Na^+ and K^+ ions. It raises the blood serum concentration of Uric acid, Ca^{+2} and glucose by stimulating reabsorption of these agents from the renal tubules, therefore it causes hyperuricemia rather than hypouricemia.

822. (d) Meniere's disease is a disease of the inner ear characterized by episodes of deafness, vertigo and buzzing in the ears. It is thought to be caused by the build-up of fluid in the inner ear. Prochlorperazine reduces vertigo in acute attacks and Gentamicin is injected into the middle ear to reduce activity in the inner ear.

823. (c) Iodine is an element that is required in small amounts for healthy growth and development. An adult requires about 30 mg of iodine, mostly concentrated in the thyroid gland to synthesize thyroid hormones. The deficiency of iodine may lead to goiter. The daily requirement of iodine in an adult is 150 mcg per day. Seafood, vegetables, and iodized salts are dietary sources of iodine.

824. (c) Mycelex (Clotrimazole) and Nystatin are the drugs of choice for the treatment of oral candidiasis. Sporanox (Itraconazole) is indicated for the treatment of systematic fungal infection.

825. (b) Sandimmune and Gengraf are trade names of Cyclosporine. They should be avoided by patients allergic to Cyclosporine. Cyclosporine is indicated for the treatment of kidney, liver and heart transplantation. It is also indicated for the treatment of adult, nonimmune compromised patients with severe psoriasis, who have failed to respond to at least one systematic therapy. Gengraf and Sandimmune are not bioequivalent and cannot be used interchangeably without consulting a physician. Nephrotoxicity, seizure, hepatotoxicity, leukopenia and thrombocytopenia are reported side effects of the drug.

826. (a) Anorexia nervosa is a psychological illness, most common in female adolescents, in which the patients starve themselves or use other technique, such as vomiting or taking laxatives to induce weight loss. Severe weight loss, amenorrhea, and even death may result.

Psychotropic therapy such as Fluoxetine may be required to treat the disease.

827. (a) Epotein a is the glycoprotein which stimulates red blood cell production. It is produced in the kidney. It helps in the treatment of Zidovudine-induced anemia.

Neupogen (Filgrastim) is a granulocyte colony stimulating factor produced by recombinant DNA technology. It is helpful in patients receiving myelosuppression, bone marrow transplantation, and in patients with severe chronic neutropenia.

Leukine (Sargamostim) is a recombinant human granulocyte macrophage colony stimulating factor. It is mainly indicated for myeloid reconstitution after autologous bone marrow transplantation.

828. (d) All. The overdose symptoms of Propoxyphene are respiratory depression with cheyne stokes respiration, hypoxia, pinpoint pupil construction, pulmonary edema and circulatory collapse.

829. (d) Drug Fact and Comparison does not have any information about drugs used outside of the USA. It is mainly helpful for finding out indications, adverse effects, toxicities, overdose treatment and doses of the drugs that are available in the USA.

Matriandale Extra Pharmacopoeia, Index Nominum, United States Adopted Name, and USP are reference materials for finding out information about drugs used outside of the USA.

830. (d) Aldomet (Methyldopa) is an antihypertensive agent that acts through Alpha-2 receptor agonist activity, Alpha-2 receptor stimulation prevents the release of noradrenaline. With prolonged use of Methyldopa, 10 to 20% of patients develop a positive direct Combs test. It usually occurs between 6 to 12 months after initiating therapy.

Before treatment is initiated, it is desirable to do a blood count to establish whether there is anemia present or not. A periodic blood count should be done thereafter to detect hemolytic anemia. If Comb's positive hemolytic anemia occurs, the therapy should be discontinued. Usually anemia remits promptly. If not, corticosteroid can be given. Fever, liver function impairment and jaundice are reported with Methyldopa therapy.

831. (b) Hemoglobin tests measure 1 gm of hemoglobin per deciliter volume of the blood.

832. (d) Skelid (Tiludronate) is a new drug useful in treatment of Paget's disease of bone. The active ingredient of Skelid is Tiludronate disodium. Each tablet contains 240 mg of Tiludronate Na. It is available in once daily dosing. Antacids may alter its absorption. It cannot be given in patients suffering from renal impairment.

833. (d) During acute attacks of asthma, TLC, FRV, RV and WBC counts are elevated and FEV count is generally decreased. These all are important terms to identify the extent of airway obstruction during acute attacks of asthma.

834. (b) Since the child has suffered from nausea and vomiting for the past few days, it is advisable to admit him immediately to the hospital to prevent further complications.

835. (d) A malignant disease in which the bone marrow may produce excessive amounts of leukocytes is known as leukemia. The overproduction of leukocytes which are immature or abnormal forms may suppress the production of normal white blood cells, red blood cells, and platelets. This may lead to neutropenia, anemia, and severe bleeding.

836. (d) PEFR is generally defined as Peak Expiratory Flow Rate. The patient should measure and record PEFR twice daily for 2 weeks. The PEFR should be measured immediately in the morning upon rising, and then 10 to 12 hours after the first PEFR measurement. The "personal best" PEFR is generally indicated by the highest PEFR found in a 2 week period.

837. (a) (Humalog) Insulin Lispro is rDNA origin derived from E.coli. It is a human insulin analog. It has a rapid onset of action (about 10 to 15 minutes) and the shortest duration of action. It is indicated for the treatment of diabetes. Hypoglycemia, tachycardia, confusion and lipoatrophy are reported side effects of the drug.

838. (d) Antivert (Meclizine) is mainly indicated for the treatment of vertigo. The recommended dose of Meclizine for treatment of vertigo is 25 to 50 mg per day. Drowsiness, dizziness and anticholinergic side effects are reported adverse effects of the drug.

839. (a) Methotrexate is a folic acid antagonist. Methotrexate may raise the serum concentration of uric acid and therefore should be carefully used in patients with gout. During Methotrexate therapy, patients should be periodically checked for whole blood counts, and hepatic and renal functions. Rheumatrex is a brand name of Methotrexate available in dose pack. Methotrexate is generally indicated for the treatment of leukemia, non-Hodgkin's disease, osteosarcoma, multiple myeloma and arthritis.

840. (b) Night blindness is reported due to dietary deficiency of vitamin A. It is defined as the inability to see in dim light or at night. It is due to a disorder of the cells in the retina that are responsible for vision in dim light, and the result of a deficiency of vitamin A. If the vitamin

deficiency continues, it may progress to xerophthalmia and keratomalacia.

841. (a) Any fall of a particular hormone (e.g. thyroid) in the blood stimulates the hypothalamus to secrete particular hormone-releasing factor (Thyroid Releasing Factor-TRF). The releasing factor then stimulates the pituitary gland to increase secretion of the particular hormone (Thyroid Stimulating Hormone-TSH). This process of stimulating particular endocrine glands in response to a decrease in the hormone level is known as Positive Feed-Back Mechanism.

842.(b) Cystic fibrotic patients secrete a large amount of viscous mucous in the bronchioles which reduces the patients's pulmonary function and increases the chances of inflammation. Pulmozyme is a recombinant human deoxyribonuclease enzyme that metabolizes the extracellular DNA that are found in mucous (due to a degeneration of leukocytes). This will help in reduction of viscosity of mucous and help in maintaining normal pulmonary function of the patient.

843. (c) Thyroid hormone has the following pharmacological actions: It increases oxygen uptake, BMR and calories production. It stimulates carbohydrate and protein metabolism and growth. It increases heart rate, and therefore palpitation and tachycardia are signs of hyperthyroidism. However, it increases serum calcium concentrations by mobilizing calcium from bones into the blood.

844. (d) Accolate (Zafirlukast), Zyflo (Zileuton) and Intal (Cromonyl Na) inhibit the slow release substance of anaphylaxis that is responsible for bronchospasm.

845. (c) Dalmane (Flurazepam) is classified as benzodiazepine. It has the longest duration of action among the all benzodiazepines.

It is indicated for the short-term treatment of insomnia. Depression, constipation, dizziness and drowsiness are reported side effects of the drug.

846. (c) Saquinavir should be stored in the refrigerator; however, once brought to room temperature it can be used out within three months.

847. (c) In movable joints, synovial fluid helps as a lubricating agent. Ligaments are defined as tough fibrous tissues that link the bones. Muscles are attached to bones by connective tissues called tendons.

848. (c) Effects of Coumadin (Warfarin) therapy can be best monitored by PT (Prothrombin time). Determination of anticoagulant plasma concentration, bleeding time and clotting times are not effective measures for monitoring Coumadin therapy.

849. (c) It increases utilization and oxidation of sugar in the tissues. It stimulates transport of glucose into cells. It increases synthesis of glycogen in muscles and the liver. It stimulates protein synthesis and growth. It also reduces breakdown of glycogen into glucose and serum glucose levels.

850. (b) Dryness of mouth, increase in thirst, irregular heart beat, muscle cramps and leg cramps are signs of HCTZ-induced hypokalemia.

851. (d) Starvation may inhibit the secretion of insulin to prevent hypoglycemia. The other all choices may stimulate the secretion of insulin from the pancreas.

852. (d) In normal resting cardiac muscles, the membrane is positive outside with respect to inside. This is because of a large concentration of sodium ions that lie outside the membrane. The large concentration of sodium ions

outside is due to an enzyme $\text{Na}^+\text{K}^+\text{ATPase}$ pump. As the membrane is excited, the permeability of the membrane is changed and as a result there is an influx of sodium ions and an efflux of potassium ions. The influx of sodium ions increases intracellular calcium levels which increases the contraction of muscles. Digitalis inhibits the $\text{Na}^+\text{K}^+\text{ATPase}$ pump, this may increase the influx of sodium ions and intracellular calcium levels. This leads to increase the force of contractions of the heart in CHF patients.

853. (d) Charcoal plus, Actidose with sorbitol (Activated Charcoal with sorbitol) and Actidose Aqua (Activated charcoal suspension) are indicated for the treatment of accidental overdose of metals and drugs.

854. (b) Calcium channel blockers are indicated for the treatment of angina because they decrease in myocardial contractility. They reduce the oxygen consumption of the heart. They increase coronary blood flow by producing dilation of coronary blood vessels. They also reduce preload in the heart.

855. (d) The ionized species of molecules are less likely to reabsorb from renal tubules. Lipid soluble drugs are more likely to reabsorb from the renal tubules.

856. (c) Thiazide diuretics may stimulate the reabsorption of glucose from renal tubules and raise the blood glucose concentration. Insulin and oral sulfonylurea therapy need to be reconsidered for patients currently on thiazide diuretics therapy.

857. (d) Weight loss is not a side effect of vasodilators. Most vasodilators are associated with hypotension, tachycardia, palpitation, edema, weight gain, and facial flushing. They lower blood pressure in normal and hypertensive subjects. They are indicated for the treatment of hypertension.

858. (d) Tagamet (Cimetidine) has a CP450 inhibition property that inhibits the metabolism of other drugs. It increases the toxicities of Theophylline and Ketoconazole. Concurrent use of antacids and H₂-receptor antagonists may not be recommended since absorption of H₂ receptor antagonists may be impaired by antacids. Patients should be advised not to take any antacids within 1/2 to 1 hour of taking any H₂-receptor antagonist.

859. (a) Norvasc (Amlodipine) is classified as calcium channel blocker. It has the least incidence of reflex stimulation of the sympathetic nervous system and thus the least chance of producing reflex tachycardia. It is indicated for the treatment of hypertension and angina. The recommended dose of the drug is 5 mg to 10 mg once daily. Hypotension, tachycardia, dizziness and edema are reported side effects of the drug.

860. (c) Lymph fluid is a thin, watery, clear, modified tissue fluid formed by the passage of substance from the blood capillaries into the tissue spaces. It flows in a closed system of vessels, sinuses, and capillaries; it is called a lymphatic system.

Lymph fluid normally consists of a large number of leukocytes, mainly lymphocytes. It also contains water, protein, fats, carbohydrates, urea, creatine, and nonprotein nitrogenous substances. RBC and platelets are not present in lymphatic fluid.

861. (b) Hepatic toxicity is more common with Isoniazid and Phenelzine.

862. (c) The principal function of the lymph node is to protect cells against microbes and foreign bodies. They form the first line of defense. They screen the lymph and thus filter and prevent microbes, toxins, and foreign bodies from spreading. The spread of cancer cells is usually prevented by lymphatic glands. They also give birth to lymphocytes.

863. (c) Ritalin (Methylphenidate) is generally indicated for the treatment of attention deficit syndrome. It is available in 5, 10 and 20 mg of oral strength. It is a schedule II controlled drug. It is also available in sustained release tablet form. Ritalin (Methylphenidate) has a mild central nervous system stimulant property. Nervousness, insomnia and anorexia are common adverse effects reported with Ritalin. The recommended daily dose of Ritalin is 20 to 30 mg, in 2 to 3 divided doses. Ritalin SR has a duration of action up to 8 hours and is available in 20 mg of oral strength. Ritalin should be carefully prescribed with MAO inhibitors.

864. (d) Severe hypertensive crisis is observed when Meperidine, Fluoxetine or Tyramine is concurrently prescribed with Selegiline. Concurrent use is strictly prohibited. Eldepryl (Selegiline) is classified as an MAO B inhibitor. It is indicated for the treatment of Parkinson's. It inhibits the metabolism of dopamine and increases its concentration at dopamine receptor sites. The recommended dose of the drug is 10 mg per day in two divided doses. Insomnia, tachycardia, CNS stimulation, dizziness, fainting, nausea, and vomiting are reported side effects of the drug.

865. (d) Retrovir (Zidovudine) was first approved by the FDA for treatment of HIV. It is classified as antiviral agent. Severe anemia, granulocytopenia, nausea, vomiting, and hepatomegaly with steatosis are reported side effects of the drug. The recommended dose of the drug is 100 mg every 4 hours.

866. (d) Flushing is a major complication of Niacin (Nicotinic acid) therapy, and can be prevented by:

- I Taking Niacin with food.
- II Initiating therapy with a low dose of the drug.
- III Taking aspirin 30 minutes prior to Niacin.

867. (c) The active ingredient of Humibid LA is Guaifenesin. Guaifenesin is an expectorant. Humid LA provides 600 mg of Guaifenesin in sustained release form. It increases respiratory fluid secretion and helps to loosen phlegm and bronchioles secretion. By reducing the viscosity of secretion, it increases the efficiency of the mucosilliary mechanism in removing accumulated secretions from the upper and lower respiratory airway. Humibid DM contains Dextromethorphan HBr as a cough suppressant.

868. (c) When a subject changes the posture from the lying down position to the upright, there is a reflex rise in blood pressure compensate a momentary hypotension, however many times in patients taking adrenergic blockers, this hypotension remains for a sustained time after changing posture. It is called postural hypotension.

869. (c) Tegretol (Carbamazepine) is an enzyme-inducer drug. Other choices such as Tagamet (Cimetidine), Prozac (Fluoxetine), Cipro (Ciprofloxacin) and Cordarone (Amiodarone) are enzyme inhibitors. They inhibit the metabolism and increase the toxicity of other drugs.

Enzyme inhibiting drugs:

Amiodarone	Diltiazem
Fluvoxamine	Cimetidine
Erythromycin	Ciprofloxacin
Fluconazole	Ketoconazole
Metronidazole	Clarithromycin
Fluoxetine	Nefazodone
Quinidine	Valproic acid
Verapamil	

Enzyme inducing drugs:

Carbamazepine	Phenytoin
Griseofulvin	Rifabutin
Isoniazid	Rifampin
Phenobarbital	

870. (b) The blood serum concentration of epinephrine and norepinephrine is generally found to be elevated in patients with pheochromocytoma. Pheochromocytoma is generally defined as an adrenal medulla cancer in which a large amount of noradrenaline and adrenaline secrete from the adrenal medulla.

871. (b) Zyvox (Linezolid) is a synthetic antibacterial agent of the oxazolidinone class. It is indicated for treatment of susceptible aerobic gram positive infections. It is a reversible, nonselective inhibitor of monoamine oxidase.

872. (d) Erythromycin and other antibiotics may increase the absorption of Digoxin by altering the normal GI flora in the stomach, which inactivates Digoxin prior to its absorption. When Quinidine is used simultaneously with Digoxin, the serum concentration of Digoxin would normally raise. Colestipol and Questran may reduce the absorption of Digoxin by binding to the acidic moiety of Digoxin. Also, Digoxin suppresses the A.V. node conduction. Diltiazem and Verapamil both have negative effects on A.V. node conduction, which results in bradycardia when used concurrently with Digoxin.

873. (d) PhosLo (Calcium Acetate) is indicated for the treatment of hyperphosphatemia. The recommended dose of the drug is 2 tablets with each meal. Constipation, hypercalcemia, anorexia and nausea are reported side effects of the drug.

874. (b) The principal function of bile salt is to emulsify fats and increase its surface area so that pancreatic lipase can easily convert fats into triglyceride and glycerol.

875. (c) A normal therapeutic range of Activated partial Thromboplastin Time is 35 to 45 seconds.

876. (a) Vancocin (Vancomycin) enema is generally indicated for treatment of antibiotic induced P. colitis caused by clostridium difficile.

877. (b) The normal therapeutic serum concentration of potassium should be 3.5 to 5 meq/L.

878. (d) Pentobarbital and Secobarbital are short-acting barbiturates. Their onset of action is 10 to 15 minutes, and their duration of action is about 3 to 4 hours.

Long acting	Onset of action	Duration
Phenobarbital	1 hour or longer	10 to 12 hrs

Intermediate	Onset of action	Duration
Amobarbital	3/4 to 1 hour	6 to 8 hrs
Butobarbital		

Short acting	Onset of action	Duration
Pentobarbital	10 to 15 minutes	3 to 4 hrs
Secobarbital	10 to 15 minutes	3 to 4 hrs

879. (a) Norvir (Ritonavir) oral solution contains 49% alcohol. It should be carefully prescribed with drugs producing disulfiram-like reactions such as Metronidazole, Chlorpropamide, Cefoperazone, Cefamandole, Cefotetan, and Disulfiram. Ritonavir is classified as an antiviral drug. It is a protease inhibitor. It is indicated for the treatment of HIV infections. Nausea, vomiting, diarrhea, anorexia, flatulence, and asthenia are reported side effects of the drug. The recommended dose of the drug is 600 mg b.i.d.

880. (b) Tranxenes SD is a sustained release preparation of Clorazepate. It is indicated for the treatment of anxiety disorders, acute alcohol withdrawal and partial seizures. Tranxene SD and Tranxene SD half-strength tablets contain 22.5 mg and 11.25 mg of Clorazepate respectively.

881. (b) Coumadin (Warfarin) should be carefully prescribed with Tricor (Fenofibrate). The dosage of Coumadin (oral anticoagulant) should be reduced to maintain the desired prothrombin time/INR in order to prevent bleeding complication.

Fenofibrate is a lipid regulating agent. It is indicated for treatment of hypercholesterolemia and hypertriglyceridemia. Pancreatitis, cholelithiasis, nausea and vomiting, diarrhea, and renal toxicity are reported side effects of the drug. The recommended dose of the drug is 67 mg per day with meal.

882. (d) Aluminum and Magnesium containing antacids reduce rate (Cmax) and extent of absorption (AUC) of Omnicef (Cefdinir) by 40%. If antacids are required during Omnicef therapy, they should be administered 2 hours before or after Omnicef therapy.

Iron supplements reduce the extent of absorption of the drug by 80%. The iron supplements should be taken 2 hours before or after Omnicef therapy.

Probenecid inhibits the renal excretion of Cefdinir. This will increase the blood concentration and toxicity of the drug. Simultaneous administration of these two drugs is strictly prohibited.

883. (b) Zemplar (Paricalcitol) is a synthetically manufactured vitamin-D analog. It is indicated for the prevention and treatment of secondary hyperparathyroidism associated with chronic renal failure. The recommended initial dose of the drug is 2.8 to 7 mcg, administered as a bolus dose no more frequently than every other day at any time during dialysis.

884. (b) 500cc of 5% Dextrose solution contain $\frac{500 \times 5}{100} = 25$ grams of dextrose.

100

885.(d) The transmitting substance, a chemical, that causes the impulses to transfer from one axon to another is known as a neurotransmitter. There are five principal neurotransmitters in the brain. They account for various functions and the deficiency of particular neurotransmitters may cause specific disorders.

<u>Neurotransmitter</u>	<u>Disorder</u>
Serotonin (deficiency)	Depression
Dopamine (deficiency)	Parkinsonism
Dopamine (excess)	Schizophrenia
Acetylcholine (deficiency)	M. graves
Histamine (excess)	Ulcer and allergic reactions
Epinephrine (excess)	Adrenal medulla cancer
Epinephrine (deficiency)	Depression

886. (d) 1 in 100 solution is interpreted as 1 gm of drug in 100cc of solution. We want to find out how much atropine is required to dispense 1 quart (960cc) of 1 in 100 solution, therefore:

$$= \frac{960 \times 1}{100} = 9.6 \text{ gm atropine} = 9600\text{mg.}$$

887. (d) 22.91 drops/min

We need to infuse 20 cc + 50 cc + 30 cc + 1000 cc = 1100 cc within 8 hours, therefore,

$$= 1100 \text{ cc} / 8 \times 60$$

$$= 2.291 \text{ cc/min}$$

I.V. set delivers 10 drops/cc,

$$= 10 \text{ drops/cc}$$

$$= 22.91 \text{ drops}/2.291\text{cc}$$

$$= 22.91 \text{ drops/min}$$

888. (c) Azopt (Brinzolamide) is indicated for glaucoma and elevated intraocular pressure of the eyes. It is a carbonic anhydrase inhibitor. It inhibits the carbonic anhydrase in the ciliary processes of the eye and thus decreasing aqueous humor production and reducing intraocular pressure. The recommended dose of drug is 1 drop in affected eye(s) t.i.d.

889. (b) The amount of sodium hypochlorite required to prepare 1000 cc 0.25% solution,

$$= \frac{1000 \times 0.25}{100} = 2.5 \text{ gm}$$

We have 5% Dakin (sodium hypochlorite) solution on stock,

$$= \frac{2.5 \times 100}{5} = 50 \text{ cc of 5\% solution}$$

890. (b) Tazorac (Tazarotene) topical cream and gel are indicated for the treatment of psoriasis and acne.

891. (a) The extended release action of Ditropan XL is attributed to GITS. It is an antispasmodic and anticholinergic agent. It is indicated for the treatment of overactive bladder with symptoms of urge urinary incontinence, urgency and frequency.

892. (b) The drug is decomposing according to first order kinetic:

$$t = \frac{2.303 \times \log C_0}{K}$$

$$= \frac{2.303 \times \log 10^{-2}}{2.303 \times 10^{-10}}$$

$$= 40 \times 10^9 \text{ hours}$$

893. (a) The principal adverse effect of Doxorubicin is cardiac failure. The cumulative dose more than 550 mg/mm² precipitates cardiac toxicity.

894. (c) The amount of Triamcinolone in 1% of 1 lb of ointment:

$$= \frac{454}{100} = 4.54 \text{ gm of triamcinolone}$$

If we add 5000 mg of Triamcinolone,

$$= 4.54 \text{ gm} + 5.0 \text{ gm} \\ = 9.54 \text{ gm of triamcinolone.}$$

The percentage of triamcinolone in the final mixture:

$$= \frac{100 \times 9.54}{454} = 2.1 \text{ percentage w/w}$$

895. (c) Amifostine is indicated to reduce the cumulative renal toxicity associated with repeated administration of Cisplatin. Amifostine is a prodrug that is dephosphorylated by alkaline phosphate in tissues to a pharmacologically active free thiol metabolite. This metabolite is believed to be responsible for the reduction of the toxic effect of Cisplatin.

896. (a) The osmolarity of sodium bicarbonate solution can be calculated as follows:

$$\text{mOsm/L} = \frac{\text{wt (gm/L)} \times \text{No. of species} \times 1000}{\text{molecular weight}}$$

$$25 \text{ gm/100cc} = 250 \text{ gm} / 1000\text{cc}$$

A number of species = 2

$$= \frac{250 \times 2 \times 1000}{84} = 5952.38 \text{ mOsm/L}$$

897. (b) Mycelex Troches are indicated for the treatment of oral candidiasis. Each troche

contains 10 mg of Clotrimazole. The recommended dose is one troche five times a day for fourteen consecutive days.

898. (b) 510 calories

Each gram of dextrose provides 3.4 cal or kcal.

Calories provided by 500cc D30W:

$$= \frac{500 \times 30 \times 3.4}{100} = 510 \text{ calories or kcal.}$$

899. (a) The disorder of the eye in which the person can see near objects perfectly but finds difficulty to see the distance is defined as myopia. Myopic people are short-sighted. The person should wear biconcave lenses (-ve lenses) to correct this.

Hypermetropic people are long-sighted. They can see distant objects well but experience difficulty in seeing near objects. This can be corrected by wearing convex lenses (+ve lenses).

900. (c) The amount of HCl acid required to prepare 1 gallon of 2.5% HCl is as follows:

$$= \frac{3840 \times 2.5}{100} = 96 \text{ gm HCl acid}$$

The purity of HCl acid is 35% w/w, so to get 96 gm of HCl, we need:

$$= \frac{96 \times 100}{35} = 274.28 \text{ gm of HCl}$$

The volume of HCl acid needed to prepare 274.28 gm of HCl is

$$= \frac{274.28 \text{ gm}}{1.25 \text{ gm/ml}} = 219.42 \text{ ml of HCl}$$

901. (b) Actiq is an oral transmucosal form of Fentanyl. It is Controlled II drug. It is designed to dissolve slowly in the mouth in a manner to facilitate transmucosal absorption.

It is indicated for the management of breakthrough cancer pain. It is available in six strengths equivalent to 200, 400, 600, 800, 1200 and 1600 mcg of Fentanyl base.

902.(b) Atacand (Candesartan) is Angiotensin II receptor antagonist. It is indicated for the treatment of hypertension. The normal therapeutic recommended dose of the drug is 16 mg once day. It is available in 4 mg, 8 mg, 16 mg and 32 mg of strength.

903. (b) 0.025 min^{-1}

For the first order kinetic:

$$K = \frac{2.303}{t} \times \log \frac{C_0}{C}$$

$$= \frac{2.303}{90} \times \log \frac{500}{50}$$

$$= \frac{2.303}{90} \times \log 10$$

$$= 0.025 \text{ min}^{-1}$$

904. (a) Renal impairment is the major toxicity of Foscavir (Foscarnet). Frequent monitoring of creatinin clearance is required. It is indicated for the treatment of CMV retinitis in patients with acquired immunodeficiency syndrome.

905. (d) 480 cc of 20% sodium bicarbonate solution contains

$$= 480 \times 0.2$$

$$= 96 \text{ gm of sodium bicarbonate}$$

$$= 96000 \text{ mg of sodium bicarbonate}$$

$$\text{Equivalent weight} = \frac{\text{molecular weight}}{\text{number of valence}}$$

$$= \frac{84 \text{ gm/mole}}{1} = 84 \text{ gm}$$

$$\begin{aligned} 1 \text{ equivalent} &= 84 \text{ gm sodium bicarbonate} \\ 1 \text{ mEq} &= 84 \text{ mg sodium bicarbonate} \end{aligned}$$

$$\text{mEq of Na}^+ = \frac{96000 \text{ mg}}{84 \text{ mg}} = 1142.85$$

906. (b) Adrenaline is the principal secretion of the medulla of the suprarenal gland. It produces a number of pharmacological actions on the body.

1. It increases the force of contraction and rate of the heart.
2. It relaxes bronchial smooth muscles.
3. It converts glycogen into glucose in the liver.
4. It also increases the coagulation process.

907. (d) The recommended adult dose for H.pyroli infection is 20 mg Omeprazole, 500 mg Clarithromycin and 1000 mg Amoxicillin, each given twice day for 10 days.

908. (b) Tocainide is indicated for the treatment of ventricular arrhythmia. Agranulocytosis, bone marrow suppression, leukopenia, neutropenia, aplastic anemia, septicemia and septic shock have been reported with Tocainide.

Pulmonary fibrosis, interstitial pneumonitis, fibrosing alveolitis, pulmonary edema and pneumonia have been reported with Tocainide.

The recommended therapeutic dose of the drug is 400 mg three times day.

909. (b) The extended release action of Toprol XL is attributed to its multiple unit system containing Metoprolol in a multitude of controlled release pellets. Each pellet acts as a separate drug delivery unit and is designed to deliver Metoprolol continuously over the dosage interval.

It is indicated for the treatment of hypertension. The recommended therapeutic dose of the drug is 50 mg once a day.

910. (b) During starvation, glucagon and growth hormone maintain the blood glucose level. The main stimulus for the secretion of glucagon is a fall in blood glucose levels. The rise in blood glucose inhibits the secretion of glycogen.

911. (b) Arimidex (Anastrozole) is indicated for the treatment of breast cancer. It is a non-steroidal aromatase inhibitor.

Many breast cancers have estrogen receptors, and growth of these tumors can be stimulated by estrogens such as estradiol.

Aromatase enhances the conversion of androstosterone to testosterone; the former is a major source for estradiol.

The recommended dose of the drug is one 1-mg tablet taken once a day.

912. (c) Glucagon is a polypeptide secreted by the pancreas. It raises blood glucose by accelerating breakdown of glycogen into glucose (glycogenolysis), stimulating the formation of glucose from non-carbohydrate sources. It also stimulates the deamination of amino acids and production of cAMP from adenylate cyclase.

913. (b) Cataract formation is normally reported with chronic use of Seroquel (Quetiapine). It is recommended to examine the lens for cataract formation at initiation and every six months thereafter during therapy.

Seroquel (Quetiapine) is indicated for the treatment of psychotic disorder. NMS, orthostatic hypotension, tardive dyskinesia and cataract formation are reported side effects of the drug. The recommended therapeutic dose of the drug is 300 mg to 400 mg per day in two to three divided dose.

914. (d) The extended release action of Sular (Nisoldipine) is attributed to its external coat with an internal core. Both coats and cores contain Nisoldipine, the coat as slow release formulation and the core as a fast release formulation.

It is indicated for the treatment of hypertension. The recommended therapeutic dose of drug is 20 to 40 mg per day.

915. (b) Atenolol (B-blocker) and Chlorthalidone (diuretic) are active ingredients of Tenoretic. They are indicated for the treatment of hypertension.

916. (a) The active ingredients of Zestoretic are Lisinopril and Hydrochlorothiazide. Thiazide diuretics should be avoided in patients with Sulfonamide allergy.

917. (c) TPN solution should provide 55% of 1500 non-protein calories as dextrose,

$$\begin{aligned} &= 1500 \times 0.55 \\ &= 825 \text{ calories as dextrose} \end{aligned}$$

The grams of dextrose required:

$$= \frac{825}{3.4} = 242.64 \text{ gm dextrose}$$

The number of cc of dextrose 30% required:

$$= \frac{242.67 \times 100}{30} = 808.82 \text{ cc dextrose sol}^n.$$

918. (c) A TPN solution provides 1100 non protein calories and 45% of non-protein calories as fat, therefore one can say:

$$\begin{aligned} &= 1100 \times 0.45 \\ &= 495 \text{ calories from fat.} \end{aligned}$$

The remaining (1100-495) 605 calories are provided by dextrose, the maximum dextrose concentration is 12.5%, and each gram of dextrose provides 3.4 calories.

$$= \frac{605}{3.4} = 177.94 \text{ gm dextrose}$$

The volume required to provide 177.94 gm of dextrose as a 12.5% concentration:

$$= \frac{177.94 \times 100}{12.5} = 1423.52 \text{ cc dextrose.}$$

919. (b) Zoladex (Goserelin) is a synthetic analogue of LHRH. It acts as a potent inhibitor of pituitary gonadotropin secretion. It is indicated for the treatment of carcinoma of the prostate and breast, and endometriosis. It is also indicated as an endometrial thinning agent.

920.(a) Zomig (Zolmitriptan) is a 5-HT receptor agonist. It is indicated for the treatment of migraine with or without aura in adults. The recommended dose of the drug is 1 mg to 1.25 mg at initiation of therapy, and if the headache returns, the dose may be repeated after 2 hours, not to exceed 10 mg within 24 hours.

921. (d) Zomig (Zolmitriptan) should be carefully prescribed to patients with hypertension or ischemic heart disease. It should not be taken with MAO inhibitors or ergot alkaloid containing products.

922. (b) When Carbidopa and Levodopa tablets are to be given to patients who are being treated with Levodopa, Levodopa therapy must be discontinued 8 hours before therapy with the combination product is initiated.

923. (d) Permax (Pergolide mesylate) is indicated for the treatment of Parkinson's disease. It is an ergot derivative Dopamine receptor agonist. It is 10 to 1000 times more potent than Bromocriptine (Parlodel) on a milligram per milligram basis. The normal recommended dose of drug is 1 to 3 mg per day.

924. (d) Zanaflex (Tizanidine) is a centrally acting alpha-2 receptor agonist. It is indicated for the short-term treatment of spasticity. It presumably reduces spasticity by in-

creasing presynaptic inhibition of motor neurons. It has a shorter duration of action. The recommended therapeutic dose of drug is 4 to 6 mg as needed, not to exceed a single dose more than 8 mg and a total daily dose more than 24 mg.

925. (a) Allegra (fexofenadine) is an antihistamine with selective peripheral H-1 receptor antagonists. It is indicated for the relief of symptom associated with seasonal allergic rhinitis in adults and children 6 years of age or older. The recommended dose of drug is 60 mg twice daily or 180 mg once daily.

926. (c) The nasal decongestant in Allegra-D (Fexofenadine) is Pseudoephedrine. Fexofenadine is an active metabolite of Terfenadine. It is classified as a Histamine H1 receptor antagonist. It is indicated for the treatment of seasonal allergic rhinitis. Drowsiness, dizziness, pharyngitis, and fatigue are reported side effects of the drug. The recommended dose of the drug is 60 mg b.i.d or 180 mg once daily.

927. (b) Glucose is the only substance that the brain can utilize for the production of energy.

928. (c) Anzemet (Dolasetron) is indicated for the treatment of nausea and vomiting associated with emetogenic cancer therapy. It is a selective serotonin 5 HT₃ receptor antagonist. It is available in tablet and injection form. The recommended adult dose of drug is 100 mg, 1 hour before chemotherapy.

929. (a) Anzemet (Dolasetron) should be administered with caution in patients who have or may develop prolonged of cardiac conduction intervals, particularly QTc.

These include patients taking diuretics with a potential for causing hypokalemia and hypomagnesemia, and patients taking antiarrhythmic drugs or other drugs which lead to QT prolongation.

930.(b) The active ingredient of Arava is Lefunomide. It is an immunomodulatory agent indicated for the treatment of rheumatoid arthritis. It inhibits dihydroorotate dehydrogenase, an enzyme responsible for pyrimidine synthesis.

The recommended dose of the drug is 20 mg per day. It must not be prescribed to pregnant women.

931. (c) The most frequently reported side effect of Carafate (Sucralfate) is constipation. It is indicated for the treatment of duodenal ulcers. The recommended adult oral dosage for duodenal ulcers is 1 gm four times day.

932. (a) Clomid (Clomiphene) is indicated for the treatment of ovulatory dysfunction in women during pregnancy. It is classified as an ovarian stimulant agent. It combines with estrogen receptors. Through negative feedback mechanism, the hypothalamus and pituitary are stimulated to increase secretion of FSH and LH. Under the influence of increased levels of these hormones, an ovarian follicle develops, followed by ovulation and corpus luteum development. Blurred vision, spots or flashes, posterior capsular cataract, spasm of retinal arteriole, and uterine bleeding are reported side effects of the drug. The recommended dose of the drug is 50 mg per day for five days.

933. (b) DDAVP (Desmopressin) is a synthetic analogue of the natural pituitary hormone. It is an antidiuretic hormone affecting renal water conservation. It is indicated for the treatment of Hemophilia A, Von Willebrand's disease and Diabetes insipidus.

934.(d) The correct DEA number can be calculated by the following formula.

(1) The first letter should be A or B and generally indicates "dispensing".

(2) The second letter should be the first initial of the last name of prescriber. (e.g. S for Dr. Sheghi, Rama)

(3) The rest of the seven numbers are verified by the following formula.

* Add the first, third and fifth numbers.

$$2 + 3 + 7 = 12$$

* Now find the sum of second, forth and sixth numbers of DEA number and multiply by 2.

$$3 + 2 + 6 = 11, \text{ and } 11 \times 2 = 22$$

* Now add the sum of first, third and fifth numbers to the second, forth and sixth sum.
 $12 + 22 = 34.$

* The number to the far right of this resultant sum should match with the seventh number of the DEA number.

AS 2332764

935. (c) Lantus (Insulin glargine) is a recombinant human insulin analog with a duration of action up to 24 hours. It is produced by recombinant DNA technology utilizing a nonpathogenic laboratory strain of E. Coli as the production organism. It must not be diluted or mixed with any other insulin solution. It should be administered subcutaneously once a day at bed time. Hypoglycemia is the principal side effects of the drug.

936. (d) Spermatogenesis starts at puberty under the influence of gonadotrophins secreted from the anterior pituitary gland.

The primary spermatocyte undergoes first meiotic division to form two secondary spermatocytes. The total diploid number of chromosomes

(46) of primary spermatocyte are reduced to half (23) by the first meiotic division. Therefore, each secondary spermatocyte contains only 23 chromosomes. They undergo a second maturation meiotic division. This is similar to mitotic division and the number of chromosomes remains the same. After finishing secondary meiotic division, each secondary spermatocyte produces two spermatids. This may produce a total of four spermatids from two secondary spermatocytes. These four spermatids may convert into sperm after maturation.

937. (d) Vioxx (Rofecoxib) is a second generation NSAID with fewer G.I. side effects compared to the traditional NSAID. It is indicated for the treatment of pain. The recommended therapeutic dose is 12.5 mg per day.

938. (b) The principal side effect of orally inhaled corticosteroid is oral candidiasis. It can be prevented by gargling with water after each inhalation. Mycelex Troche (Clotrimazole) and Nystatin Pastilles are drugs of choice.

939. (b) Nilandron (Nilutamide) is a non-steroidal orally active antiandrogen. It is indicated for the treatment of metastatic prostate cancer. The recommended dosage is six tablets (50 mg each) once a day for a total daily dose of 300 mg for 30 days, followed thereafter by three tablets (50 mg each) once a day for a total daily dosage of 150 mg.

940. (b) Patients on Nilandron therapy reported a delay in adaptation to the dark, ranging from seconds to a few minutes, when passing from lighted areas to dark areas. Patients who experience this effect should be cautioned about driving at night or through tunnels. This effect can be reduced or alleviated by wearing tinted glasses.

941. (b) Prifitin (Rifapentine) inhibits DNA dependent RNA polymerase enzymes. It is indicated for the treatment of pulmonary tuberculosis.

942. (b) Refludan (Lepirudin) is indicated for the treatment of Heparin-Induced Thrombocytopenia. HIT is described as an allergy-like adverse reaction to heparin. The recommended bolus dose of drug is 0.4 mg/kg/body weight/hour slowly intravenously, followed by 0.15mg/kg/body weight/hour as a continuous I.V. infusion.

943. (c) Rifadin (Rifampin) causes a reddish discoloration of the urine, sweat, sputum and tears. It is indicated for the treatment of tuberculosis.

944. (a) Rifamate (Rifampin/Isoniazid) therapy should be closely monitored by regularly checking the serum transaminase level. Isoniazid therapy is associated with severe and fatal hepatitis. Rifater contains Rifampin, Isoniazid and Pyrazinamide.

945. (a) Synercid (Quinupristin/Dalfopristin) is specifically indicated for the treatment of Vancomycin Resistant Enterococcus Faecium. The recommended dose of drug is 7.5 mg/kg every 8 hours. Inflammation, pain, edema, pseudomembranous colitis, vasodilation and pancreatitis are reported side effects of the drug. The recommended dose of the drug is 7.5 mg/kg every eight hours.

946. (d) Taxotere (Docetaxel) therapy should be closely monitored for abnormal liver function and neutropenia. Therapy should only be initiated if bilirubin, SGOT/SGPT levels and neutropenia counts fall in the normal limit. It is indicated for the treatment of breast cancer and Non-small lung cancer.

947. (a) Severe fluid retention or edema is reported with Taxotere. It should be carefully prescribed in patients suffering from CHF.

948. (c) Pentoxifylline is indicated for the treatment of peripheral vascular disease.

It is classified as a hemorrhheological agent, i.e. an agent that affects the blood viscosity. The recommended dose of Pentoxifylline is 400 mg three times a day with meals.

949. (c) Stimate (Desmopressin) is indicated for the treatment of Von Willebrand's disease and Hemophilia A. It is a synthetic analog of the natural pituitary hormone Vasopressin. It is available in nasal spray form. The dose is administered by nasal insufflation, one spray per nostril, to provide a total dose of 300 mcg.

950 (d) Pancrelipase microspheres should be swallowed whole. Administration of capsules on empty stomachs with applesauce (acidic food) or chewing them may destroy their enteric coating and inactivate them with gastric acid. If a capsule's content is mixed with applesauce or any other acidic food, it should be swallowed immediately.

951. (b) Urso (Ursodiol) is a naturally occurring bile acid found in humans. It is indicated for the treatment of biliary cirrhosis. It is also known as Ursodeoxycholic acid. The recommended dosage is 13-15 mg/kg/day administered in four divided doses with food.

952. (a) Bumex (Bumetanide) is classified as a loop diuretic. It is indicated for the treatment of edema associated with CHF, nephrotic syndrome and hepatic cirrhosis. Hypokalemia and electrolyte loss are major side effects of the drug. The recommended dose of the drug is 0.5 to 2 mg per day.

953. (c) Ototoxicity, cumulative renal toxicity, myelosuppression, nausea and vomiting are reported side effects of the drug.

954. (c) Myocardial toxicity is a principal side effect of Doxorubicin. It is dose related. It should be carefully prescribed in patients with CHF.

955. (b) Poliomyelitis is an infectious virus disease caused by poliovirus. It affects the CNS. The virus is excreted in the feces of an infected person and disease is the most common where sanitation is poor. Symptoms are normally reported 7 to 12 days after infection.

956. (a) Avelox (Moxifloxacin) is a fluoroquinolone type antibiotic. It is a synthetic broad spectrum agent. Seizure, bradycardia, CNS stimulation, QT interval prolongation and anaphylaxis are reported side effects of the drug. The recommended dose of the drug is 400 mg every 24 hours for 10 days.

957. (b) Baycol (Cerivastatin) is a HMG-CoA inhibitor. It is indicated for the treatment of hypercholesterolemia. The recommended starting dose of drug is 0.4 mg once daily in the evening. Rhabdomyolysis with acute renal failure secondary to myoglobinemia, myopathy, edema and back pain are reported side effects of the drug.

958. (d) Ketoacidosis is a life-threatening condition in which an increase ketones is present in tissues and body fluids. Nausea, vomiting, abdominal tenderness, confusion, coma, extreme thirst, weight loss, and acetone odor of breath are symptoms.

959. (b) Meningitis is defined as inflammation of the meninges due to infection by virus or bacteria. Neisseria meningitis and Hemophilus influenza are the most causative agents for meningitis.

Signs and symptoms of Meningitis:

- * Intense headache
- * Fever
- * Loss of appetite
- * Intolerant to light and sound
- * Rigidity of muscle
- * Vomiting
- * Convulsion
- * Delirium

960. (c) K-PHOS tablets should be taken with a full glass of water, with meals and at bed time. It increases urinary phosphate and pyrophosphate. It is used as a phosphorous supplement.

961. (b) K-PHOS original contains potassium acid phosphate as an active ingredient. It is classified as a urinary acidifier. It increases the antibacterial activity of methenamine by enhancing its conversion to formaldehyde in acidic urine.

962. (d) Myocardial toxicity is a major side effect associated with Daunorubicin and Doxorubicin. Esmolol is a beta blocker. All these drug must be used very carefully by patients suffering from CHF.

963. (b) Glucagon is indicated for the treatment of hypoglycemia associated with Insulin treated diabetic patients. It induces liver glycogen breakdown, releasing glucose from the liver. Blood glucose concentration rises within 10 minutes of injection and maximum concentrations are attained a half hour after injection. Hepatic sources of glycogen are necessary to produce an antihypoglycemic effect.

964. (a) Betapace (Sotalol) is indicated for the treatment of documented ventricular arrhythmia. It is a beta blocker. It is mainly eliminated via the kidneys through glomerular filtration and to a small degree by tubular secretion. There is direct relationship between creatinin clearance and elimination of Sotalol. Patients must be checked for normal renal function before initiating therapy.

965. (b) Betapace AF is an antiarrhythmic agent. It is indicated for the maintenance of normal sinus rhythm. It causes ventricular arrhythmia. To minimize the risk of induced arrhythmia, patients initiated on Betapace AF should be placed for a minimum of three days under strict medical supervision. Betapace should not be substituted for Betapace AF

because of significance difference between patient package insert, dosing administration and safety information.

966. (d) Climara (Estradiol) is indicated for the treatment of moderate to severe vasomotor symptoms associated with menopause. It should be changed every week.

967. (b) Quinidine increases the serum concentration of the following drugs:

Warfarin	Digoxin	Haloperidol
Procainamide	Nifedipine	

Quinidine has no clinically significant effect on the pharmacokinetics of the following drugs:

Diltiazem	Mephytoin	Metoprolol
Propafenon	Propranolol	Timolol
Tocainide		

Its pharmacokinetics are also unaffected by cigarette smoking.

968. (d) Betaseron (Interferon beta-1b), Baclofen (Lioresal), Dantrium (Dantrolene) and Avonex (Interferon beta -1a) are indicated for the treatment of multiple sclerosis. Zagam (Sparfloxacin) is an antibacterial agent indicated for the treatment of community acquired pneumonia.

969. (c) Permethrine is classified as a scabicial agent. It is indicated for the treatment of infestation with *Sarcoptes scabiei* (scabies).

970. (b) Avita (Tretinoin) is indicated for the treatment of acne vulgaris. It should be applied once a day, preferably in the evening. Before applying cream, patients have to wash the skin with mild soap and dry skin gently. Patients have to wait for at least 20 to 30 minutes before applying medication. It is very important for skin to be completely dry in order to minimize possible irritation.

971. (a) Clorpress (Clonidine + Chlorthalidone) is indicated in the treatment of hypertension. The recommended dose of Clonidine is 0.1 mg twice day. Chlorthalidone is usually initiated with 25 mg once daily.

972. (d) Leg cramps are not a sign of hyperkalemia.

Signs of Hyperkalemia:

Paresthesias
Muscular weakness
Bradycardia
Fatigue
Flaccid paralysis of the extremities
Shock

973. (a) Mafenide is a topical agent indicated for adjunctive therapy of patients with second and third degree burns.

974. (b) The active ingredients of Aggrenox are Aspirin and Dipyridamole. They are indicated to reduce the risk of stroke in patients who have had transient ischemia of the brain, or completed ischemic stroke due to thrombosis. Each tablet contains 200 mg Dipyridamole in an extended release form, and 25 mg Aspirin is an immediate release form.

975. (d) Catapres transdermal patches should be replaced every week. They are available in three strengths which deliver 0.1 mg, 0.2 mg or 0.3 mg per day for 7 days.

976. (b) The active ingredient of Zydys is Olanzapine. It is indicated for the treatment of schizophrenia. It is available as a readily disintegrated tablet in 5 mg and 10 mg of unit dose strength. NMS, tardive dyskinesia and extrapyramidal symptoms are reported side effects of the drug.

977. (c) $PK_w = PK_a + PK_b$ ($PK_w = 14$)

$$14 = PK_a + PK_b$$

$$PK_b = 14 - 9 = 5$$

978. (b) Flomax (Tamsulosin) is indicated for the treatment of signs and symptoms of Benign Prostatic Hyperplasia. It is an antagonist of α_{1A} adrenoreceptor in the prostate. Hypotension and first dose syncope are reported side effects of the drug. The recommended dose of the drug is 0.4 mg once daily.

979. (c) Micardis (Telmisartan) is an angiotensin II receptor antagonist. It is indicated for the treatment of hypertension. The recommended dose of drug is 40 to 80 mg once a day. Angioedema, hypotension, hyperkalemia and nausea are reported side effects of the drug.

980. (c) Mobic (Meloxicam) is a NSAID. It is indicated for relief of the signs and symptoms of osteoarthritis. The recommended initial dose of drug is 7.5 mg to 15 mg once daily. It may be taken without regard to timing of meals. It should be carefully prescribed to patients hypersensitive to NSAID.

981. (b) Persantine (Dipyridamole) is a platelet adhesion inhibitor. It is indicated as an adjunct to coumarin anticoagulants in the prevention of postoperative thromboembolic complications of cardiac valve replacement. The recommended dose of drug 75 to 100 mg four times day. Bleeding is the principal side effect of the drug.

982. (d) Serentil (Mesoridazine) is in the phenothiazine class of drugs. It is indicated for the treatment of schizophrenia. The recommended starting dose of drug is 50 mg, three times day. It is available in tablet, injection and concentrate syrup form.

983. (d) Hectorol (Doxercalciferol) is indicated for the reduction of elevated iPTH levels in the management of secondary hyperparathyroidism in patients undergoing chronic renal dialysis. It is a synthetic vitamin D analog which undergoes metabolic activation to 1-alpha-25 dihydroxy vitamin D₂, an active form of Vitamin D₂.

984. (c) Phoslo (Calcium acetate) is indicated for the treatment of hyperphosphatemia in end stage renal failure. The recommended dose of PhosLo for the adult dialysis patient is 2 tablets with each meal.

985. (b) Reye's syndrome is a rare but serious illness reported with aspirin or aspirin containing products. Aspirin (Acetylsalicylic acid) is indicated for treatment of pain. It is also used to reduce the risk of stroke in CHF. The recommended dose of the drug for pain is 325 mg every 4 to 6 hours as needed. GI. ulcer and bleeding are reported side effects of the drug.

986. (c) The active ingredients of Avalide are Irbersartan and Hydrochlorothiazide. It is indicated for the treatment of hypertension. Irbersartan is an Angiotensin II receptor antagonist. The recommended dose of drug is 150/12.5 mg to 300/25 mg per day. It should be given once daily.

987. (b) Lactic acidosis is a rare but serious side effect associated with Glucophage (Metformin) therapy. It is characterized by elevated blood lactate levels (> 5mmol/L). Glucophage is indicated for the treatment of diabetes. The recommended dose of the drug is 500 mg b.i.d.

988. (b) Glucophage (Metformin) normally decreases hepatic glucose production and intestinal absorption of glucose. It also improves insulin sensitivity by increasing peripheral glucose uptake and utilization.

989. (c) Plavix (Clopidrogel) is an inhibitor of platelets aggregation. It is indicated for the reduction of atherosclerotic events such as myocardial infarction, stroke, and vascular death. The recommended dose of drug is 75 mg once a day with or without food.

990. (d) Pravachol (Pravastatin) is an HMG COA inhibitor. It is indicated for the treatment of atherosclerosis with elevated lipid level. The recommended dose of drug is 10, 20 or 40 mg once day. It can be administered at any time of the day.

991. (b) Serzone (Nefazodone) is indicated for the treatment of depression. It is structurally unrelated to SSRI, MAO inhibitor and TCA. The recommended dose of drug is 200 mg day in two divided doses. The drug should be carefully used with terfenadine, astemizole, cisapride, TCA and MAO inhibitor.

992. (b) Stadol NS (Butorphanol) is the opioid analgesic available in nasal formulation. It is indicated for the treatment of pain. It is a mixed agonist-antagonist type. The recommended dose for initial nasal administration is 1 mg (one spray in nostril). If adequate pain relief is not achieved within 60-90 minutes, an additional 1 mg dose may be given.

993. (b) Pulmonary fibrosis is the most severe adverse effect associated with Bleomycin. It is indicated for the treatment of Squamous cell carcinoma, non-Hodgkin's lymphoma and testicular carcinoma.

994. (d) Cystic fibrosis is an autosomal recessive disorder in which defective CFTR proteins are found. The CFTR facilitates the transport of chloride ions across the membrane of epithelial lined cells. The altered chloride transport results in altered sodium and water distribution, causing thickened epithelial secretions and mucus. This will lead to pulmo-

nary, gastrointestinal, pancreatic, and hepatic manifestations.

995. (b) Droxia (Hydroxyurea) is indicated to reduce the frequency of painful crises and to reduce the need for blood transfusions in adult patients with sickle cell anemia.

996. (b) $PH = PK_w - PK_b + \log \text{base/salt}$

$PH = PK_a + \log \text{base/salt}$ ($PK_a = PK_w - PK_b$)
 $10 = 8 + \log \text{base/salt}$
 $\log \text{base/salt} = 2$ and therefore,

$\text{base/salt} = 100 : 1$.

997. (a) LDL (Low Density Lipoproteins) is the major cholesterol carrying lipoprotein in human plasma. It is derived from catabolism of VLDL. This process normally occurs in blood vessels. LDL is converted into cholesterol by the enzyme HMG CoA reductase. This is the rate limiting step in synthesis of cholesterol. LDL is involved in the transport of cholesterol to peripheral tissues and is potentially atherogenic, whereas HDL is involved in the transport of cholesterol from the periphery to the liver and is antiatherosclerosis.

998. (a) The active ingredient of Mesnex (Mesna) is sodium-2mercaptoethane sulfonate. It is indicated as a prophylactic agent in reducing the incidence of ifosfamide-induced H.cystitis.

999. (c) Glycogen storage disease is also known as McArdle's disease. It is an inborn error of the metabolism in which a deficiency of the enzyme Myophosphorylase is found. It prevents the breakdown of glycogen to lactate in exercising muscles. This results in fatigue, pain, and cramps in exercising muscles.

1000. (a) Nausea, vomiting and bone marrow suppression are dose related side effects of

Carboplatin. It is indicated for the treatment of ovarian carcinoma.

*****END*****