BP Ist yr Ist SEM

# PHARMACEUTICS-I

## 16 Marks Question

1. Write a short note on (any four)
   (16)
   a. Capsule
   b. Powder
   c. British pharmacopoeia
   d. Code of pharmaceutical ethics
   e. Advantages of dosage form
2. Explain different pharmaceutical additives which are used in dosage form.
3. Describe in brief about classification of dosage form.
4. Briefly describe factors influencing dose and action of drugs.
5. Define incompatibility. Enlist its type & describe in brief about chemical incompatibility.
6. Classify & explain different dosage form with suitable examples.
7. Write a short note on
   (16)
   a. Proof spirit
   b. Displacement values
   c. Biphasic liquid dosage form
   d. Prodrug
8. Define isotonic solution. What are the principles for adjusting isotonicity? Write down the methods to calculate isotonicity of solution.
9. Write a short notes on
   (16)
   a) Diluents b) Polymer & its application c) Physical incompatibility d) Implant
10. Explain in briefly different incompatibilities.
11. Explain about various pharmaceutical additives which are commonly used in dosage form
12. Define posology. What are the various factors affecting dose of drug?
13. Write a short notes on (any two)
    (16)
    a. Organoleptic additives
    b. Isotonic solution
    c. Liquid dosage form
    d. Metric system
    e. Imperial system
    f. USP
    g. B.P
14. Define incompatibility. Enlist its types and describe about physical incompatibility.

15. Write a short notes on (any four)
(16)
    a. British Pharmacopoeia
    b. Vehicle
    c. Liquid dosage form
    d. Therapeutic incompatibility
    e. Erythrocytes
    f. Biphasic liquid dosage form
    g. Metric system
    h. Semisolid dosage form
16. How will you classify different dosage forms? Write the importance of dosage form.
17. Define solid dosage forms. How will you classify solid doses forms? Write in brief about dentifrices and effervescent granules.
18. What are monophasic liquid dosage forms? Write in detail about syrups and elixir.
19. Discuss the various factors which affect the dose of medicine.
20. Define incompatibility. What are different types of incompatibilities? Describe in brief about physical incompatibility.
21. Explain in brief about additives which are generally used in dosage forms.
22. Discuss the chemical incompatibilities which occur due to alkaloidal salts.
23. Explain the chemical incompatibility which occur due to evaluation of carbon dioxide.
24. Discuss in brief the various reasons which cause therapeutic incompatibility.
25. What is physical incompatibility? Explain the physical incompatibility which occurs due to:
    a. Immiscibility
    b. Liquefaction
    c. Insolubility
    d. precipitation
26. Write short notes on the following (any four)
    a. Accumulation
    b. Idiosyncrasy
    c. Synergism
    d. Tolerance
    e. Additive effect
    f. tachyphylaxis

## 10 Marks Question

1. Describe about history of I.P.
2. Explain about systems of weight & measures.
3. Classify the solid dosage form.
4. Explain about semisolid dosage form.
5. Describe in briefly about monophasic liquid dosage form.
6. Classify the different dosage form with suitable examples.
7. Describe about Inorganic Incompatibility.
8. Explain about liquid dosage form.

9. Describe in brief about new drug delivery system.

## 8 Marks Question

1. Explain history of Indian pharmacopoeia.
2. Define pharmacopoeia. Give salient features of second edition of pharmacopoeia of India.
3. Explain liquid dosage form.
4. Enlist pharmacopoeia & standard books which are commonly used in India and describe salient features of first edition of pharmacopoeia of India.
5. Define posology. What are various factors affecting dose & action of drug.
6. Explain about metric system.
7. Describe about vehicles & give reason why water is commonly used as vehicles.
8. Explain about isotonic solution.
9. Explain in brief about organic incompatibility.
10. Describe in details about Imperial system.
11. Solve any four from following

a) Why solid dosage forms are generally preferred?
b) Define dosage form & give its ideal properties.
c) Define paratonic solution & hypotonic solution
d) Describe various methods of calculating dose of child.
e) Fill in the blanks

| | | |
|---|---|---|
| i. | 1 teacupful | =--- fluid ounce |
| ii. | 1 decigram | =--- gram |
| iii. | 12 ounce | =--- pound |
| iv. | 1 Oz (Avoir) | =--- grains |

12. Write the salient features of fifth edition of I.P 2007.
13. Give, in brief, history of the Pharmacopoeia of India.
14. What are the salient features of third edition of I.P?
15. Give the salient features of second edition of I.P.
16. Describe in detail the various stages which ultimately led to the development of first pharmacopoeia of India.
17. Write briefly what you know about therapeutic incompatibility.
18. Describe in brief about classification of Tablet.
19. Write a short notes on: a. Erythrocytes b. prodrug

## 6 Marks Question

1. Describe in brief various reasons which cause therapeutic incompatibility.
2. Write a short note on physical incompatibility.
3. Define the following terms (any six)
    i. Lozenges
    ii. Gargles
    iii. Dentifrices
    iv. Linctus
    v. Dental cone
    vi. Dentifrices
    vii. Posology

viii. Snuff
ix. Cachets
x. Buccal tablet

4. Describe about organoleptic additives.
5. Explain about USP.
6. Prepare 400ml of 5% solution & label with a direction for preparing 2 litre quantity of 1 in 2000 solution.
7. Explain about therapeutic incompatibility.
8. Write a short note on capsule
9. Explain about types of tablet.
10. Enlist different additives in dosage form & explain about stabilizers.
11. Give the advantages & disadvantages of solid dosage form.
12. Explain about hydrocolloids.
13. Give the various formulae for calculation of dose on basis of age, sex& surface area.
14. Describe about organoleptic additives.
15. Explain about polymer and their application.
16. Convert the following
    i. 1 fluid ounce =----- minim
    ii. 1 gallon =----- fluid ounce
    iii. 1 centigram =-----mg
    iv. 1 gram =----grains
    v. 1 drops =----- ml
17. Describe about displacement values.
18. Explain about isotonic solution.
19. Explain about salient features of first edition of I.P
20. Explain various routes of drug administration with suitable examples.
21. Give the various formulae for calculation of child dose.
22. Explain about the new drug delivery system.
23. Calculate the amount of 70%, 60%, 40%, & 30% alcohol should be mixed to get 50% alcohol.
24. Describe about proof spirit.
25. Calculate the volume of each 90%, 60%, 30% & water are required to produce 500ml of 50% alcohol.
26. How dose for children are calculated on basis of age, body weight and surface area.
27. Describe briefly the solid dosage forms.
28. How will you distinguish w/o and o/w emulsions?
29. Write a short note on powder.
30. Write the different methods which are used to correct physical incompatibilities.
31. How will you dispensed the mixture in which precipitate yielding interaction occurs?
32. How alkaloidal salts are precipitate during or after dispensing the mixture?
33. Explain about biphasic liquid dosage form.
34. Prepare 400 ml of 5 % solution and label with a direction for preparing 2 litre quantities of 1 in 2000 solution.
35. Calculate the amount of 95% alcohol required to prepare 400 ml of 45% alcohol.
36. How many proof gallons are contained in 4 gallons of 70% v/v alcohol?

37. Explain about Displacement value.
38. Calculate the displacement value of zinc oxide in cocoa butter suppository containing 40% of zinc oxide and is prepared in 1 g mould. The weight of 8 suppositories is 11.74g.

## 4 Marks Question

1. Why solid dosage form is preferred as compared to other dosage form.
2. Define dosage form and drug.
3. Differentiate between ethics and law.
4. Write a short note on film and strips.
5. Define dosage form & give its ideal properties.
6. Differentiate between fine powder & granules.
7. Give various formulae for calculation of child dose.
8. Differentiate between hard gelatin capsule and soft gelatin capsule
9. Differentiate between Lotion & Liniment
10. Differentiate between Emulsion and Suspension.
11. Differentiate between syrup and Elixir
12. Differentiate between Paste and Ointment
13. Differentiate between o/w and w/o emulsion
14. Differentiate between Flocculated and deflocculated suspension
15. Convert $120^{o}$ F into $^{o}$C.
16. Find proportion of dextrose needed to form a solution iso-osmotic with blood plasma. (Given: molecular wt. of dextrose= 180)
17. Write importance of dosage form.
18. Calculate the volume of 95% alcohol required to prepare 400ml of 45 % alcohol.
19. Find the strength of 95% v/v alcohol in terms of Proof spirit.
20. Calculate the amount of 70%, 60%, 40% and 30% alcohol shoud be mixed to get 50% alcohol.
21. Differentiate between fine powder & granules.
22. Convert the following
    i. 1 decigram = --------gram
    ii. 1 quart = --------ml
    iii. 1 ml = --------minims
    iv. 1 tablespoonful = --------fluid drachma
    v. 1 tumbleful =---- ml
23. Calculate real strength of $25^{o}$ O.P &$30^{o}$ U.P.
24. Give the ideal characteristics of preservative.
25. Calculate displacement value of zinc oxide in coca butter suppositories containing 40 % of zinc oxide & prepared in 1 g mould. The wt. of 8 suppositories is 11.74g.
26. Describe in brief about pharmaceutical code of ethics.
27. Enlist pharmacopoeias & some of standards reference books which are commonly used in India.
28. Find concentration of NaCl required producing a solution iso osmotic with blood plasma. (Given: Mol.Wt. of NaCl= 58.5)
29. Explain about alcohol dilution.

30. Give the advantages of dosage form.
31. Classify dosage form on the basis of route of administration.
32. Explain about allegation method.
33. Explain about advantages and disadvantages of solid dosage form.
34. Calculate quantity of potassium permagnet required to prepare 1 pint of 1 in 600 solutions. (1 pint= 20 fluid OZ)
35. Fill in the blanks
    a. 1g =----------grains
    b. 4ml =----------fluid drachm
    c. 1 quart =---------- ml
    d. 1 Hectogram =---------- grams

## 2 Marks Question

1. Define the term Pharmacopoeia.
2. Name the various pharmacopoeias and standards books commonly used in India.
3. Give the reasons for publication of International pharmacopoeia by W.H.O.
4. In which years the various editions of pharmacopoeia of India come out?
5. How many monographs are there in the Indian Pharmacopoeial list?
6. Define the term unit dosage form.
7. Why drugs are not given in their original pure state?
8. What do you know about dusting powders?
9. Why pills are outdated preparations?
10. Give three examples of monophasic liquid dosage form meant for internal use.
11. Give five examples of monophasic liquid dosage form meant for body cavities.
12. Write the Young's formula which is used to calculate the dose of a child.
13. Write the Clak's formula.
14. What is Dilling's formula?
15. Define the term posology.
16. Define the term incompatibility.
17. Explain the term adjusted incompatibility.
18. What does the term tolerated incompatibility mean?
19. What are different types of incompatibility?
20. What is meant by term physical incompatibility?
21. Define the term chemical incompatibility?
22. Differentiate between ethics and law.
23. Define Drug and dosage form.

# PHARMACEUTICAL INORGANIC CHEMISTRY-I

1. Define pharmaceutical chemistry. 2M
2. Explain the various aspects of pharmaceutical chemistry. 4M
3. Explain the importance of inorganic chemistry in pharmacy. 8M
4. Define pharmaceuticals and explain about their uses. 8M
5. Explain about various pharmacopoeias. 8M
6. Write the salient features of recent edition of Indian Pharmacopoeia. 8M
7. Define the following terms: 8M
   [i] Misbranded drug [ii] Adulterated drug
   [iii] Standard of quality [iv] Spurious drug
8. Define the term monograph and explain with any one official drug. 8M
9. Briefly explain about the storage conditions of drugs. 8M
10. Describe the development of pharmacopoeias. 8M
11. Briefly explain about Drugs and Cosmetics Act 1940. 8M
12. Classify pharmaceutical inorganic compounds based on their applications with examples. 8M
13. Explain methods to control impurity in pharmaceutical substances. 8M
14. Explain about pharmaceutical index. 8M
15. Briefly explain the history of Indian Pharmacopoeia. 8M
16. Define the term Purity and Impurity. 4M
17. Explain about the various types of impurities present in the formulations. 8M
18. Write a note on sources of impurities in pharmaceuticals. 8M
19. Explain briefly about the importance of quality control of pharmaceutical substances. 8M
20. Write a short note on effect of impurities. 8M
21. What are the various methods used to purify the inorganic substances and briefly explain it. 8M
22. Define test for purity and standards and write the important criteria which decide the choice of tests prescribed in Pharmacopoeia. 8M
23. Define limit test and write the importance of limit test. 8M
24. Why the pharmacopoeia does not prescribe 'Numerical Value' for the limit of impurities likely to be present in pharmaceutical compounds. 8M
25. Explain the principle and procedure involved in the following limit tests. 16 M
   [i] Limit test for sulphate. [ii] Limit test for chloride.
   [iii] Limit test for iron.
26. Explain about the factors which are to be considered while fixing the limit . 8M
27. Write the reason of the followings. 12 M
   [a] Uses of dilute nitric acid in the limit test for chloride.
   [b] Uses of barium sulphate reagent in the limit test of sulphate.
   [c] Uses of citric acid , thioglycolic acid and dilute ammonia solution in the limit test for iron.
28. Explain about the limit test for heavy metals. 8M
29. Write about the modified Gutzeit method for the limit test for arsenic. 8M

30. Explain about the principle and procedure underlying the limit test for lead in I.P. 8M
31. Write the two characteristic reactions of sodium, potassium and calcium. 12M
32. Write the confirmatory tests for chloride and sulphate with balanced chemical equations. 8M
33. How do you differentiate between anions and cations. 4M
34. What is mean by loss on drying and loss on ignition, Write about the significance of it and explain the method.8M
35. Explain how limit test for lead is different from the limit test for heavy metals. 8M
36. How the ferrous ions and ferric ions are identified and differentiated by chemical tests. 8M
37. Enumerate the two identification test for nitrate and phosphate. 4M
38. Explain about the identification test for carbonate and bicarbonates. 4M
39. Write note on indicators. 8M
40. What are indicators, explain their importance in analytical chemistry. 8M
41. Define the term impurity. How do they get incorporated in pharmaceutical substances? 8M
42. Define inhalants? Enumerate the official inhalants. 8M
43. Write any two large scale method of preparation for oxygen. Write its test for purity. 8M
44. Write the preparation supply and storage condition of nitrogen. What are its various uses. 8M
45. Write in detail about preparation, properties and applications of ammonium carbonate in medicine. Highlight its advantage over dilute ammonia solution. 8M
46. Write a note on helium gas and its importance. 4M
47. Write the methods of preparation, properties, uses of following compounds. 8M
    [a] Nitrous oxide  [b] Oxygen
48. Explain in detail about nitrous oxide. 4M
49. Write the method of preparation, properties, and test for purity, and uses of carbon dioxide. 8M
50. Define the term antioxidants? Enumerate commonly used antioxidants, their chemistry, properties and specific uses. 12M
51. Write in detail about any two official antioxidants. 8M
52. Explain the method of preparation, properties, and uses of hypo phosphorous acid. 8M
53. Write the mechanism of action of antioxidants. 4M
54. Explain about any two sodium compounds which are used as antioxidants. 8M
55. Write briefly about the importance of antioxidants in pharmaceutical substance storage. 8M
56. Explain the following compounds. 12M
    [a] Sodium nitrite  [b] Sodium thiosulphate  [c] Sodium bisulphate
57. Define desiccants and explain about silica gel. 4M
58. Define excipents and enumerate the official excipients. 8M
59. Explain about dibasic calcium phosphate and tri basic calcium phosphate. 8M
60. Write about the preparation, properties, test for identification, and uses of magnesium stearate. 8M

61. Enumerate the inorganic excipients used in solid form. Explain their properties and uses. 8M
62. Define suspending agents. List out the official suspending agents. 8M
63. Explain about bentonite. 8M
64. Write the preparation, properties, and uses of the following. 8M
[a] Colloidal silica [b] Aluminium stearate
65. Write a note on suspending agents. 8M
66. What is meant by colorants explain with examples.4M
67. Write in detail about two types of ferric oxide and its applications. 4M
68. Define solvent and vehicles with examples. 8M
69. Write about important method of preparation of purified water. 8M
70. Explain about the followings. 12M
[a] Distilation [b] Ion exchange method or demineralization [c] Reverse osmosis
71. Define filter aids. 4M
72. Write in detail about the followings. 8M
[a] Kieselguhr [b] Fullers earth
73. Define preservatives and classify them with examples. 8M
74. List out the important inorganic preservatives used in pharmaceuticals.8M
75. What is meant by radio activity, How was the phenomenon discovered. 8M
76. Explain the general theory of radioactivity. 4M
77. Define the following terms.8M
[a] Nuclides [b] Isotopes
[c] Isobars [d] Isotones
78. Explain the different types of nuclear reactions. 4M
79. Write the emission of $\alpha$, $\beta$-particles with equation. 4M
80. What is meant by Negatron and Positron. 4M
81. Define radioactive half life. 4M
82. Write the decay series of radioactivity. 4M
83. How does the radioactive isotope are produced. Briefly explain the methods of production.8M
84. How does the radioactivity of a substance is measured. 8M
85. Write the principle and procedure involved in gas ionization methods. 8M
86. Explain in detail about the working principle, construction, advantages and disadvantages if Geiger Muller counter with neat labled diagram. 12M
87. Explain in detail about scintillation counter & write the advantages and disadvantages. 8M
88. Describe proportional counters. 8M
89. Write in brief about biological effects of radiation.4M
90. Explain the application of radio pharmaceuticals. 8M
91. Write in brief about the therapeutic uses of radio pharmaceuticals. 8M
92. Explain the diagnostic uses of radiopharmaceuticals. 8M
93. Define ratio opaque contrast media. 8M
94. Write the preparation, properties, and uses of barium sulphate. 8M
95. What type of precaution to be taken while handling radioactive materials. 8M

96. Explain the radiopharmaceutical sodium phosphate. 4M
97. Describe sodium iodohippurate 1-131 injection USP.4M
98. Write in detail about the uses of radioisotopes in research, diagnosis and medicine. 8M
99. Write the radio pharmaceutical ferric citrate. 4M
100. Explain why stannous hydrochloric acid and lead acetate is used in limit test of Arsenic 4M
101. Differentiate between organic and in organic compound. 8M
102. Define inhalant, explain role of $CO_2$, $O_2$ and ammonia & write method of preparation & pharmaceutical uses of nitrous oxide.16M
103. Define limit test and explain type of permissible impurities and sources of impurities, and explain limit test for chloride.16M
104. Define antioxidant, explain mechanism of action, properties & give method of puparations and use of sodium metabisulphite and sodium nitrite.16M
105. Define radioactive substances; explain half life period and applications of radio pharmaceuticals in pharmacy. 16M
106. Explain sources of impurities & types of permissible impurities in pharmaceutical preparation as per IP.8M
107. Define antioxidant explain mechanism of action & explain sodium compounds any two act as antioxidant.8M
108. Define buffer solution buffer action &buffer capacity.8M
109. Explain various concepts of acid & base with limitations.8M
110. Explain limit test of chloride and sulphate.8M
111. Define pharmaceutical aid & explain each with suitable example.8M
112. Explain properties of $\propto, \beta, \gamma$ rays & explain radio-opaque contrast media.8M
113. Explain various types of official water with chemical properties.8M
114. Explain various methods to convert hard water into soft water.8M
115. Explain method of preparation &pharmaceutical uses of following inorganic compounds.12M
    a) boric acid b) hypo phosphorus acid c) phosphoric acid
116. Explain working &construction of G.M counter.8M
117. Explain method of preparation and Pharmaceutical used of following compound.12M
    a) sodium metabisulphite b) sodium thiosulphate c) sodium nitrite
118. Explain Arrhenius concept of acid and base.4M
119. Explain physiological acid base balance.4M
120. Explain alkalosis & acidosis.4M
121. Explain limit test of arsenic.4M
122. Explain Gutzeit test of arsenic.4M
123. Give a short note on suspending agents.4M
124. Give a short note on tableting aids.4M
125. Give a short note on pharmaceutical acceptable glasses. 4M
126. Give a short note on selection of buffers in p,ceutical preparations.4M
127. Give a short note on pharmaceutical buffers.4M
128. Give a short note on inhalants.4M
129. Give a short note on radiopharmaceuticals.4M

130.Give a short note on selection of antioxidants.4M
131. Give a short note on half life of radio pharmaceuticals.4M
132. Explain application of ratio pharmaceuticals in diagnosis.4M
133. Explain Lowry and Bronsted concept of acid and base with limitation.4M
134. Explain Lewis concept of acid and base with limitations.4M
135. Explain limit test of sulphate.4M
136. Explain limit test of iron.4M
137.Write Importance of buffers in pharmacy.4M
138.Short note on theory of acid base Indicators.4M
139.Give reason why lead acetate & stannous hydrochloric acid used in arsenic limit test.4M
140.Explain limit test of Lead. 4M
141.Explain various body buffers 8M
142.Explain role of hemoglobin as buffer.8M
143.Explain role of bicarbonate and carbonic acid in maintaince of pH
144.Explain hemoglobin as a oxygen carrier. 4M
145.Explain Sulpur dioxide as an antioxidant 4M
146.Write a note on permanent hardness. 4M
147.Write a note on temporary hardness. 4M
148. Explain why hydrochloric acid is called as spirit of salt.4M.
149.Explain HSAB principle of acid and base.4M
150.Give method of preparation and pharmaceutical uses of sodium bisulphate 4M.

# Pharmaceutical biochemistry I

**Question carrying 16 Marks**

1. Define cell and explain its cellular components with well labelled diagram.
2. Define and classify carbohydrate with suitable example. Add a note on the functions of carbohydrate.
3. Describe structure and functions of mucolpolysaccharides.
4. Give an account of structural configuration of monosaccharides, with special reference to glucose.
5. Discuss the structure and functions of 3 biochemically important disaccharides.
6. Define polysaccharides and describe the structure of 3 homopolysaccharides.
7. Write an account of classification of lipids with suitable examples.
8. Describe structure and functions of phospholipids.
9. Discuss the saturated and unsaturated fatty acids of biological importance, along with their structures.
10. Describe the structure of steroids. Add a note on functions of cholesterol.
11. Discuss the biological importance of amphipathic lipids.
12. Describe the classification of amino acids along with their structure.
13. Discuss organization of protein structure. Give the account of determination of primary structure of protein.
14. Describe the classification of protein with suitable examples.
15. Write an account of non standard amino acids.
16. Discuss the biologically active peptides.
17. What are enzymes? Describe their classification and nomenclature.
18. Write an account of various factors affecting enzyme activity.
19. Describe mechanism of enzyme action.
20. What are coenzymes? Write briefly on the role of coenzymes in enzyme action.
21. Write an account of the importance of serum enzymes in diagnosis of diseases.
22. Classify vitamins and briefly discuss their functions and deficiency disorders.
23. Describe the chemistry, biochemical functions, daily requirements, sources and deficiency manifestations of vitamin A.
24. Write an account of folic acid involvement in one carbon metabolism.
25. Discuss biochemical functions of vitamin C. Add a note on the therapeutic uses of megadoses of the vitamin.
26. Write briefly about coenzymes involved in oxidation reduction reactions.
27. Write an account of high energy compounds in metabolism.
28. Describe components of electron transport chain and discuss oxidation of NADH.
29. Define oxidative phosphorylation. Discuss chemiosmotic hypothesis in detail.
30. Give an account of enzymes involved in biological oxidation.
31. Discuss about the inhibitors of ETC and oxidative phosphorylation.
32. Give the detail emphasis on different organelles of prokaryotic and eukaryotic cell.

33. What are fat soluble vitamins? Give biochemical role and pharmaceutical applications of various fat soluble vitamins.
34. Explain in detail Protein synthesis.
35. Write a note on 1) Vitamin C 2)BMR
    3) Biological importance of peptides 4) Nutrition
36. Write a note on 1) scope of biochemistry 2) proteins
    3) Metals as coenzymes 4) Isoenzyme

**Question carrying 10 Marks**

37. Explain in detail occurrence and biological importance of monosaccharide and disaccharide.
38. Draw and explain structural relationship between D-aldoses by Fischer projection.
39. Explain in detail summary of glycosaminoglycan along with composition, distribution and functions.
40. Explain in detail balance diet components and nutritional disorders due to PEM.
41. Give in brief about various factors affecting enzyme activity.
42. What is protein? Differentiate between essential and non essential amino acids.
43. Give a detail account of eukaryotic cell.
44. Write a note on (any 2)
    1) Functions of lipids 2) Define enzyme and classify it
    3) Fibres in nutrition 4) Functions of phospholipids.
45. Write in detail about components of electron transport chain.
46. Explain cellular components of cell, with a well labelled diagram.
47. Write a note on -1) Nutritional status and clinical practice.
    2) Vitamin k.
48. Write in detail about homopolyassacharides with supporting structures.
49. Define proteins; classify it and write down biological importance of peptides.
50. Explain in detail determination of primary structure of proteins.

**Question carrying 8 Marks**

51. Explain active and passive transport across cell membrane.
52. Discuss diffusion and give its mechanism.
53. Define the carbohydrate? Give classification and biological role in human body.
54. Explain in detail reactions of monosaccharides.
55. Explain different structures of proteins.
56. Write a note on michaelis mentens equation.
57. Discuss in detail enzyme inhibition.
58. Write in brief mechanism of enzyme action.
59. Explain in detail regulation of enzyme activity in detail.

60. Discuss in detail lock and key model and induced fit theory.
61. Write a note thiamine pyrophosphate, pyridoxal phosphate, coenzyme niacin.
62. Discuss in detail Fat soluble vitamins.
63. Discuss in detail water soluble vitamins.
64. Describe the different methods for nutritional evaluation of proteins.
65. Explain the components of electron transport chain.
66. Write in detail about glucose regulation mechanism in body.
67. Write about transcription and translation.
68. Explain principle nutrients.
69. Discuss in detail oxidative phosphorylation.

**Question carrying 4 Marks**

70. Define the scope and objective of biochemistry.
71. Difference between prokaryotic and eukaryotic cell.
72. Draw a neat well labelled diagram of cell.
73. Write a note on mitochondria and nucleus.
74. Write a note on endoplasmic reticulum and golgi apparatus.
75. Write a note on cell membrane.
76. Differentiate between carbohydrate and protein.
77. Define carbohydrate and give its functions.
78. Write a note on mitochondria respiration.
79. Write a note on diasaccharides.
80. Explain triacylglycerols.
81. Difference between fats and oils.
82. Write a note on ampiphatic lipids.
83. Write a note on feedback regulation.
84. Explain in short coenzyme and allosteric enzyme.
85. Explain why velocity of enzyme reaction is temperature dependent.
86. Write a note on vitamins as coenzymes.
87. Draw the structure of glucose, fructose, galactose, glyceraldehydes.
88. Define amino acids and classify them.
89. Write a note on denaturation of protein.
90. Write a note on mutarotation, osazone formation.
91. Write a note on inversion of sucrose
92. Define lipids and classify them.
93. Write a short note on sphingomyelins, phosphatidtylinositol.
94. Write a note on quaternary structure of proteins.
95. Explain enzyme specificity.
96. Write a note on competitive inhibition.
97. Write a note on serum enzymes in myocardial infarction.
98. Explain role of metals in enzyme action.
99. Write a note on pyridoxal phosphate in transamination.

100. Write a note on vitamin K in carboxylation reaction.
101. Justify “vitamin D is a hormone”.
102. Write a note on high energy bonds.
103. Explain the sites for oxidative phosphorylation.
104. Explain ATP as energy currency.
105. Write a note on major complex bio molecules of cells.
106. Give the various tests to check purity of fats and oils.
107. Justify “Amino acids useful as drugs”.
108. Explain the effect of concentration of substrate on enzyme activity.
109. Write a note on coenzymes of B-complex vitamins.
110. Explain compartmentation of metabolic pathways.
111. Write a note on vitamin A.
112. Write a note on vitamin C.
113. Write a note on vitamin B1.
114. Write a note on vitamin B12.
115. Write a note on vitamin k.
116. Explain in detail biological oxidation.
117. Give general rule for nomenclature of enzymes.
118. Explain scope of biochemistry.
119. Write a note on glycosides.
120. Explain in detail properties of proteins.
121. Write a note on allosteric regulation and allosteric inhibition.
122. Write a note on vitamin D.
123. Write a note on vitamin B2.
124. Write a note on pernicious anaemia.
125. Write a note on mutarotation.

# HUMAN ANATOMY AND PHYSIOLOGY-I

1 a) What is plasma membrane, draw its stucture and explain the structure and function of plasma membrane? 12M.

b) Draw the well labelled diagram of cell and its principal organelles. 4M

2 a) Enlist the various cellular organelles and explain the structure and function of mitochondria. 6M

b) Explain the principal organelles which in involved in the formation of protein synthesis. 4M.

c) What is reticulum, give its types and describe its function. 4M

d) Write in short about the cell components which is involved in packaging of proteins as a vesicles. 4M

3 a) Write in short about cell components which is involved in process of breaking cell frangments. 4M

b) What is cytoskeleton, give its types and describe in detail the functions of centrosome. 10M

c) What is tissue, give the types of tissues. 4M

4 a) Write a short note on 1. Columnar epthelium 2. Cubiodal epethelium
3. Keratinised epethelium 4. Non keratinised . 16M

5 a) What is connective tissue, give the functions of connective tissue. 4M

b) What are the types of connective tissue, explain the in detail the functions of cells present in the connective tissues. 12M

6 a) What is loose connective tissue, draw its outlined structure and explain its functions. 8M

b) What is adipose tissue, draw its outlined structure and explain its types and functions. 8M

7 a) Write a short note on reticular tissue. 4M

b) Write a short note on 1. Fibous tissue 2. Elastic tissue
3. Hyaline cartilage 4. Fibrocartilage. 12M

8 a) What are muscle fibres, give its location and explain the structure and functions of skeletal muscle fiber. 8M

b) Give the locations of smooth muscle and describe the structure and functions of smooth muscle. 8M

9 a) Describe in detail the cardiac muscle fibre. 8M

b) Write in short about nervous tissue. 4M

c) Justify " Heart act as a pump" 4M

10 a) How the blood act as a fluid connective tissue, enlist the functions of blood. 4M

b) Enlist the constituents of plasma, explain the functions of protein present in the plasma. 8M

c) Describe the functions of constituents present in the plasma 4M

11 a) Discuss the structure, functions and formation of erythrocytes. 12M

b) Explain the life cycle of erythrocytes. 4M

12 a) How the formation of RBC can be controlled. 6M

b) Describe the fate of RBC 6M

c) Write a short note on Rhesus System. 4M

13 a) Discuss the function and formation of different types of leucocytes. 16M

14 a) What is haemostasis, explain the function of principal cells involve in the process of haemostasis. 8M

b) Explain in detail the haemostasis process of blood coagulation. 8M

15 a) How the coagulation of blood can be controlled. 4M

b) What is anaemia, give its classification on the basis of causes. 4M

c) Write a short note on iron deficiency anaemia. 4M

d) Write in short about haemolytic anaemia. 4M

16 a) Describe the structure and functions of arteries and veins 8M

b) Write in short about capillaries 4M

c) Indicate the main factors controlling blood vessel diameter 4M

17 a) Describe the position of heart and explain the three layers of heart wall. 16M

18 a) Justify the statement 'heart is supplied by left and right coronary arteries 4M

b) Describe how the conduction system of heart work. 8M

c) Write in brief the lub and dub sounds of heart 4M

19 a) Describe in detail the stages of cardiac cycle with the suitable diagram. 12M

b) Write a short note on cardiac output. 4M

20 a) What are PQRST wave, explain with diagram the electrocardiogram of one cardiac cycle. 10M

b) Enlist the factors affecting cardiac output. 2M

c) Write a short note on stroke volume of heart. 4M

21 a) What is blood pressure, explain systolic and diastolic blood pressure. 8M

b) Explain the factors that determine blood pressure. 8M

22 How the blood pressure can be controlled, describe in detail the regulatory mechanism of short term and long term controlled of blood pressure. 16M

23 a) Explain the pulmonary circulation of heart. 8M

b) Explain the portal circulation of abdomen. 8M

24 Write a short note on ; 1) congestive heart failure 2) angina pectoris

3) myocardial infarction 4) cardiac arrhythmia 16M

25 a) Describe the composition of lymph and give the function of lymphatic system. 8M

b) Describe the structure and function of lymph nodes 8M

26 a) Describe the structure and function of spleen. 8M

b) Describe the structure and function of thymus gland. 8M

27 a) Describe the structure of outer ear. 4M

b) Describe the structure of middle ear. 4M

c) Describe the structure of inner ear. 4M

d) Explain the hearing mechanism of ear. 4M

28 a) Explain how the image is focused on retina. 4M

b) Explain the accomodation mechanism of sight. 4M

c) Explain the functions of retina. 4M

d) Explain the physiology of smell. 4M

29 a) Explain the functions of skin. 4M

b) Enlist the hormones secreted by the anterior pituitary 2M

c) Explain the negative feedback regulation of secretion of hormones secreted by the anterior pituitary gland. 4M

d) Describe briefly the function of hormones secreted by posterior pituitary gland. 6M

30 a) Outline the actions of hormones secreted by thyriod gland. 4M

b) Outline the functions of parathyriod hormones. 4M

c) Describe the actions of each of the three groups of adrenocorticoids hormones. 8M

31. a) Outline how the adrenal glands respond to stress. 4M

b) Describe the actions of insulin and glucagon. 6M

c) Write a short note on gigantism and acromegaly 6M

32. Write a short note on 1) Simple Goitre 2) Diabetes Mellitus

3) Cushing syndrome 4) Addison's disease 16M

33. Draw the diagram of cell and describe its cellular organelles. 16M
34. Draw the diagram of cell and describe in brief the plasma membrane. 8M
35. What is tissue, give its type and explain the detail of epithelial tissue. 16M
36. What is connective tissue , explain the physiology of cells present in connective tissue 16M
37. What is connective tissue, give its type and descrive a. loose connective tissue b. adipose tissue. C. dense connective tissue and write in short about cartilage. 16M
38. What is muscle tissue , give its types and describe skeletal muscle , smooth muscle and cardiac muscle. 16M
39. What is nervous tissue and describe briefly the types of cells in nervous tissue. 12M
40. Give the functions of blood as connective tissue and describe briefly the chemical composition of plasma. 12M
41. Discuss the structure, function, formation of erythrocytes and write in short about control of erythropoiesis 16M
42. Give the fate of RBC and describe the ABO system, Rhesus system and Blood group of RBC. 16M
43. What are leukocytes give its types and explain the physiology of neutrophil , eosinophils and basophils. 16M
44. Explain in detail the monocyte-macrophage system and lymphocytes. 12M
45. What are thrombocytes and explain the haemostasis mechanism of body. 16M
46. Enlist the blood clotting factors and explain the control of coagulation. 12M
47. What is anaemias give its types and give the causes and effects following disorders: A. iron deficiency anaemia b. megaloblastic anaemia c. aplastic anaemia d. haemolytic anaemia. 16M
48. Write a short note on polycythaemia and normocytic normochromic anaemia. 4M
49. Draw a well labeled diagram of simple cell 2M
50. Describe the structure of plasma membrane and give its functions 4M
51. Explain the functions of various cellular organelles 16M
52. Describe the structure and functions of epithelial tissue 10M
53. Describe the structure and functions of connective tissue 16M
54. Describe the structure and functions of muscle tissue 6M
55. Describe the structure and functions of nervous tissue 6M
56. Enlist the constituents of plasma and describe their functions 8M
57. Explain the life span and function of erythrocytes 8M
58. Describe the control of erythropoiesis and give the fate of erythrocyte 8M
59. Describe the functions and formation of different types of WBC 8M
60. Describe the stages of blood clotting and write in short control of coagulation 10M
61. Define the term anaemia describe the causes and effects of iron deficiency and megaloblastic, anaemias 10M

62. Write a short note on following disorder a. Aplastic Anaemia B. Haemolytic Anaemia C. Polycythaemia D. Leucopenia E. Leukaemia 12M
63. Write in short about thrombocytopenia and vitamin K deficiency 8M
64. Describe the structure and functions of arteries, veins and capillaries 12M
65. Explain the mechanism by which exchange of nutrients, gases and wastes occurs between the blood and the tissues 12M
66. Describe the structure of the heart and its position within the thorax 8M
67. Explain the conducting system of the heart. 12M
68. Describe the stages of cardiac cycle. 10M
69. Explain the relationship between different types of blood vessels 8M
70. Define the term blood pressure and describe the main control mechanism for regulation of blood pressure 14M
71. Describe the circulation of blood through the lungs, naming the main vessels involved in it. 8M
72. Explain portal circulation 8M
73. Write a short note on heart sounds 2M
74. Describe the coronary circulation of heart 4M
75. Explain the terms of following disorder 8M

1. Embolus
2. Thrombus formation
3. Infarction
4. Embolism

76. Describe the causes, effects and complications of atheroma 6M
77. Write a short note on arteriosclerosis 4M
78. Define the oedema and describe the main causes of oedema 8M
79. What are ischemic heart disease and write in short about angina pectoris, and myocardial infarction 10M
80. What are rheumatic heart diseases explain in brief 4M
81. What are cardiac arrhythmias, describe with reference to standard ECG trace the main cardiac arrhythmias 4M
82. Explain the term hypertension 2M
83. Define essential and secondary hypertension and list the main causes of the secondary hypertention 8M
84. Discuss the effects of prolonged hypertension on the body, including elevated blood pressure in the lungs 8M
85. What is cell , draw its well labeled diagram , enlist its organells& discuss about plasma membrane. 10M
86. Discuss the various cellular organellas . (6M)
87. Describe the structure and function of epithelial tissue. (8M)
88. Describe the structure and function of connective tissue. (8M)
89. Discuss the structure , function & formation of Erythrocyte. (16M)
90. What is white blood cells and discuss about granular leucocyte. (8M)
91. What is WBC & discuss about organular leucocyte. (8M)
92. Explain the role of platelets in blood coagrtation&write a short note on thrombocytopenia. (16m)
93. Write a short note on

a. Iron deficiency anamia
b. Leucopenia
c. thrombocytopenia

d. Megaloblasticanaemia

94. Describe the structure of heart & explain the cardiac cycle. (16M)

95. Define blood pressure, explain the factor determining blood pressure and describe the main comtrol mechanism for its regulation. (16M)

96. Describe the conduction system of heart and write a short note on Electrocardiogram (ECG). (12M)

97. Write in brief about heart sounds. (4M)

98. Describe the location, structure and function of thymus gland and write a short note on mucous associated lymphoid tissue (MALT). (16M)

99. Describe the location, structure and function of spleen. (12M)

100. Write in short about composition & function of lymph. (4M)

101. Describe the structure of outer, middle & inner part of ear. (12M)

102. Explain the physiology of hearing. (4M)

103. Describe the gross structure of eye & explain the physiology of sight. (16M)

104. Outline the action of hormones secreted by the anterior & posterior lobe of pitutory gland. (16M)

105. Describe the structure and position of thyroid gland and outline the actions of thyroid hormones? (16M)

106. Explain how blood levels of glucocorticoids are regulated. (8M)

107. Outline how the adrenal gland respond to stress. (8M)

108. Describe the actions of Insulin and glucagon. (8M)

109. Write a note on Diabetes mellitus. (8M)

110. Write a short note on : (16M)

a. Gigantism

b. Hyperthyrodism

c. Cushings syndrome

d. Addisons diseases

111. Describe the physiology of balance and write a short note on ear infection. (16M)

112. Describe the physiology of smell and taste. (16M)

113. Describe the structure & function of lymph nodes and Write in short about MALT. 16M

114. Write a note on : 16M

a. Heart sounds

b. ECG

c. Pulse

d. Blood pressure

115. Describe the structure of plasma membrane.

116. Write in short about membrane proteins.

117. Write in short about nucleus.

118. Write in short about mitochondria.

119. Write in short about ribosomes.

120. Write in short about endoplasmic reticulum.

121. Write in short about golgi apparatus.

122. Write in short about lysosomes.

123. Describe in brief about the cytoskeleton.

124. Describe briefly the simple epithelia.

125. Describe briefly the stratified epithelia.

126. What are the cells present in connective tissue explain it.

127. Write in brief about loose connective tissue.

128. Write in brief about adipose tissue.

129. Write in brief about reticular tissue.

130. Write in short about dense connective tissue.

131. Write a short note on muscle tissue.

132. Write a short note on smooth muscle.
133. Write a short note on skeletal muscle.
134. Write a short note on cardiac muscle.
135. Justify that ‘blood is fluid connective tissue’.
136. What is blood, enlist its contents and describe their functions.
137. Enlist the constituents of plasma and describe their functions.
138. What are plasma proteins, explain its functions.
139. Explain the haemopoiesis mechanism of erythrocyte.
140. Explain the function and life span of erythrocytes.
141. Explain the life cycle of erythrocytes with the help of well labeled diagrammed.
142. Write in short about haemoglobin.
143. Explain the control of erythropoeisis.
144. Write a short note on blood group with their ABO and rhesus system.
145. Explain the factors which affect transport of oxygen.
146. Write a short note on leukocytes (white blood cells).
147. Write in brief about neutrophil.
148. Write in brief about eosinophil.
149. Write in brief about basophil.
150. Explain the phagocytic action of neutrophils.
151. Explain granulocytes as a immune defence system.
152. Explain the monocyte-macrophage system.
153. Write in short about lymphocytes.
154. Write in short about reticulo-endothelial system.
155. Write in short about platelets(thrombocytes)
156. Explain the stages of blood clotting (coagulation).
157. Explain in short the haemostasis mechanism of human body.
158. Enlist the blood clotting factors and explain the blood coagulation process in short.
159. Explain the control of blood coagulation.
160. Write in short about anaemia.
161. What are the different types of anaemia.
162. Outline the role of platelets in blood coagulation.
163. Write in short about iron deficiency anaemia.
164. Write in short about pernicious anaemia.
165. Write in short about haemolytic anaemia.
166. Write in short about sickle cell anaemia.
167. Write in short about leukemia.
168. Write in short about thrombocytopenia.
169. Explain how vitamin K deficiency relates to clotting disorder.
170. Indicate the main causes and effects of thrombocytopenia.
171. Indicate main factors controlling blood vessel diameter.
172. Describe the structure of the heart and its position within the thorax.
173. Describe the anatomy of heart.
174. Describe the conduction system of heart.
175. Describe the blood flow through the heart.
176. Describe in short the coronary circulation of heart.
177. Describe briefly the cardiac cycle.
178. Write a short note on heart sounds.
179. Explain the electrical changes in the heart.

180. Describe the electrocardiogram of one cycle.
181. Write in short about cardiac output.
182. Describe the venous return process.
183. Write in short about stroke volume.
184. Describe the factors which determine heart rate.
185. Describe the term blood pressure.
186. Describe the factors that influence blood pressure.
187. Write in short about systolic and diastolic blood pressure.
188. Explain the short term regulation of blood pressure.
189. Explain the long term regulation of blood pressure.
190. Explain the effects of autonomic nervous system on the heart and blood vessels.
191. Write a short note on autoregulation mechanism in human body.
192. Explain the relationship between between stimulation of chemoreceptors and arterial blood pressure.
193. Enlist the arteries supplying blood to all major body structures.
194. Write a short note on thrombosis.
195. Write a short note on embolism.
196. Write in short about infarction and ischemia.
197. Write in short about ateroma.
198. Write in short about arteriosclerosis.
199. Write in short about myocardial infarction.
200. Write in short about cardiac failure.
201. Write in brief about cardiac arrhythmia.
202. Write in short about hypertension.
203. Write in short about hypotension.
204. Write in short about rheumatic heart disease.
205. Describe the composition and main functions of lymph.
206. Identify the locations and functions of the main lymphatic vessels of the body.
207. Describe the functions of lymph vessels and capillaries.
208. Explain the functions of lymphatic system.
209. Write in short about lymph nodes.
210. Write in short about spleen.
211. Write in short about thymus gland.
212. Describe briefly the MALT.
213. Write in short about Hodgkin disease.
214. Explain the structure of outer ear.
215. Explain the structure of middle ear.
216. Explain the structure of inner ear.
217. Explain the physiology of hearing.
218. Explain the physiology of balance.
219. Explain the associate structure and function of eye.
220. Write in short about sclera and cornea.
221. Write in short about choroid.
222. Write in short about retina.
223. Explain the physiology of sight.
224. Write in short about accommodation phenomena of eye.
225. Describe the physiology of taste.
226. Explain the physiology of smell.

227. Explain the physiology of taste.
228. Write in short about glaucoma.
229. Describe the structure of the hypothalamus.
230. Write in short about posterior pituitary.
231. Write in short about anterior pituitary.
232. Describe the position of thyroid gland and its related structures.
233. Describe the microscopic structure of the thyroid gland.
234. Outline the actions of the thyroid hormones.
235. Explain how blood levels of the thyroid hormones T3 and T4 are regulated.
236. Describe the position and gross structure of the parathyroid glands.
237. Outline the functions of parathyroid hormones and calcitonin.
238. Explain how blood levels of parathyroid hormone and calcitonin are regulated.
239. Describe the structure of adrenal glands.
240. Describe the actions of each of the three groups of adrenocorticoid hormones.
241. Explains how blood levels of glucocorticoid are regulated.
242. Describe the actions of adrenaline and noradrenaline.
243. Describe how the adrenal glands respond to stress.
244. Write in brief about adrenal cortex.
245. Write in brief about adrenal medulla.
246. List the hormones secreted by endocrine pancreas.
247. Describe the actions of insulin and glucagon.
248. How blood glucose level are regulated.
249. Write in short about the actions of insulin.
250. Write in short about the actions of glucagon.
251. Write in brief about the diabetes mellitus.
252. Write in brief about the cushing’s syndrome.
253. Write in brief about the addison’s diasease.

## 8 MARKS QUESTIONS

254. Explain the functions of principle cell organelles.
255. Describe the structure and function of epithelial tissue.
256. Describe the structure and function of connective tissue.
257. Describe the structure and function of muscle tissue.
258. Describe the composition and function of plasma.
259. Describe in detail the life cycle of erythrocytes with their haemopeisis.
260. Describe in detail about the granulocytes.
261. Describe in detail about the polymorphonuclear leukocytes.
262. Describe in detail about agranulocytes.
263. Describe the haemostasis mechanism of human body.
264. Discuss the structure,function and formation of red blood cells.
265. Discuss the function and formation of the different types of white blood cells.
266. Describe the structure and functions of arteries.
267. Describe the structure and functions of veins.
268. Describe the structure and functions of capillaries.
269. Explain the relationship between different types of blood vessels.
270. Explain the factors that affect cardiac output.

271. Explain the two main mechanisms that control blood pressure.
272. With the help of well labeled diagram explain the summary of the main mechanism in blood pressure control.
273. Explain the pulmonary circulation of blood.
274. Describe the circulation of blood through lungs naming the main vessels involved.
275. Explain the venous drainage involved in returning blood to the heart from the body.
276. Describe portal circulation of blood.
277. Descibe in brief the systemic circulation of human body.
278. Compare and contrast the typical lymph node with that of the spleen.
279. Describe the location, structure and function of the thymus gland.
280. Explain the structure and function of lymph nodes.
281. Explain the structure and function of spleen.
282. Give the composition of lymph and explain the function of lymph and lymph vessels.
283. Explain the structure and function of thymus gland.
284. Describe the structure of outer, middle and inner ear.
285. Explain the physiology of hearing.
286. Describe the physiology of balance.
287. Describe the gross structure of eye.
288. Describe the route taken by nerve impulses from the retina to the cerebrum.
289. Explain how light entering the eye is focused on the retina.
290. Explain the functions of the accessory organs of the eye.
291. Describe the physiology of smell.
292. Explain the influence of the hypothalamus on the pituitary gland.
293. Describe the structure of the hypothalamus and pituitary gland.
294. Outline the actions of the hormones secreted by the anterior and posterior lobes of the pituitary gland.

## 2MARKS QUESTIONS

295. Draw a well labeled diagram of human cell.
296. Draw a diagram of hyaline cartilage
297. Draw a well labeled diagram of fibro cartilage.
298. Draw a well labeled diagram of elastic cartilage.
299. Draw a well labeled diagram of fibrous tissue.
300. Draw a well labeled diagram of elastic tissue.
301. Draw a well labeled diagram of reticular tissue.
302. Draw a well labeled diagram of loose connective tissue.
303. Draw a well labeled diagram of adipose tissue.
304. Draw a well labeled diagram of simple epithelium.
305. What are the factors which affect cardiac cycle.
306. Draw the well labeled diagrame of showing interior portion of heart.
307. Draw the diagram showing the circulation of blood through the heart, pulmonary and systemic circulation.
308. Draw the well labeled diagram of lymph node.
309. Draw a well labeled diagrame of human ear.
310. Draw a well labeled diagrame of human eye.

# PHARMACOGNOSY I

1) Define pharmacognosy and crude drug. (2)
2) Write synonym, biological source, chemical constituent and uses of Ashwagandha. (4)
3) Write synonym, biological source, chemical constituent and uses of Shatavari. (4)
4) Differentiate between organized and unorganized drug. (4)
5) Explain the classification of crude drug with examples. (8)
6) Define adulteration. Describe the types of adulteration. (8)
7) Describe in brief traditional and alternative system of medicines. (16)
8) Define any 4 from the following (4×4=16)
   a) Veinislet Number
   b) Vein termination Number
   c) Palisade Number
   d) Stomatal Number
   e) Stomatal Index
9) Write synonym, biological source, chemical constituent and uses of Tulsi. (4)
10) Differentiate meristematic and permanent tissue. (4)
11) Write synonym, biological source, chemical constituent and uses of Gokhru. (4)
12) Define stomata and give classification of stomata. (8)
13) Explain morphological and histological character of bark. (8)
14) Describe the structure of plant cell with well labeled diagram. (8)
15) Write in detail pharmacognostic account of Ashoka bark. (8)
16) What are organized and unorganized crude drug ?Explain alphabetical and chemical system of classification of crude drugs with examples. (16)
17) Write synonym, biological source, chemical constituent and uses of any four of the following : (16)
   i) Ashwagandha
   ii) Ashoka
   iii) Shankhpuspi
   iv) Amla
18) Write notes on any 2 (8×8=16)
   a) Types of adulteration
   b) Tulsi and Neem
   c) History and development of pharmacognosy
19) Describe morphological and histological characters of leaf and flower. (16)
20) Write a note on parenchyma, collenchyma, xylem and phloem. (16)
21) Discuss homeopathy and Chinese as alternative system of medicine. (16)
22) Write a note on Gokhru and Kalmegh. (8)
23) Define adulteration. Describe the types of adulteration with its evaluation parameters. (16)
24) Define pharmacognosy and its scope. (8)
25) Discuss briefly about the ayurveda system of medicine. (8)
26) Explain alphabetical, morphological, and chemical system of classification of crude drugs with examples. (16)
27) Write synonym, biological source, chemical constituent and uses of any four of the following : (16)
   i) Brahmi

ii) Guggul
iii) Kalmegh
iv) Gokhru
v) Amla

28) Describe briefly about aromatherapy, unani and siddha medicinal system. (16)
29) Explain chemical and taxonomical methods of crude drugs. (8)
30) Write a note on simple permanent tissue. (8)
31) Explain morphological and histological characters of fruit and seed. (8)
32) Write synonym, biological source, chemical constituent and uses of any four of the following : (16)
i) Neem
ii) Arjuna
iii) Shatavari
iv) Tulsi
v) Gokhru
33) Define crude drug. Discuss classification of crude drug with examples. (16)
34) Explain in detail plant tissue with well labeled diagram. (16)
35) Write in detail pharmacognostic account of Arjuna bark. (16)
36) Write a note on any 2 (16)
37) Morphological and histological characters of fruit and seed.
a) Shatavari and Ashwagandha
b) Xylem and Phloem.
38) Write about the structure of plant cell. (8)
39) Differentiate between parenchymatous cell and cholenchymatous cell. (4)
40) Differentiate between xylem and phloem. (4)
41) Draw a well labeled diagram of plant cell. (4)
42) Differentiate between parenchyma, cholenchyma and sclerenchyma. (10)
43) Define the term tissue, classify plant tissue. (8)
44) Classify marestematic tissue. (6)
45) Write short notes on pharmacognostic scheme of crude drug. (10)
46) Differentiate between morphological and microscopical charecters. (6)
47) Write short note on wood with example. (6)
48) Write short note on bark with example. (6)
49) Write short note on leaf with example. (6)
50) Write short note on flower with example. (6)
51) Write short note on fruit with example. (6)
52) Write short note on seed with example. (6)
53) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of amla. (6)
54) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of ashwagandha. (6)
55) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of arjuna. (6)
56) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of shatavari. (6)
57) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of tulsi. (6)

58) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of shankhapushpi. (6)
59) Define the term ayurveda. Give biological source, chemical constituents, uses along with morphological diagram of kalmegh. (6)
60) Define leaf and draw well label diagram of neem leaf. (6)
61) Define leaf and draw well label diagram of tulsi leaf. (6)
62) Define adulteration and enlist its types. (8)
63) Explain the role of adulteration in pharmacognosy. (6)
64) Draw a well labeled diagram of plant cell. Explain its organelles. (10)
65) Define the term organized drug alongwith examples. (6)
66) Define Pharmacognosy.Discuss history of Pharmacognosy. (6)
67) Discuss Ayurveda and Homeopathic system of medicine in detail.(6)
68) Write a note on Yoga. 4
69) Write a note on Unani system of medicine. 4
70) Write a note on Siddha system of medicine
71) Write a note on Naturopathy
72) Write a note on Chinese medicine
73) Write a note on Aroma therapy
74) Write a note on Homeopathy system of medicine
75) Write a note on Ayurveda system of medicine
76) Describe briefly about Aroma therapy, Unani, and Siddha system of medicine (16)
77) Define the term Pharmacognosy. Discuss the scope of Pharmacognosy with reference to Indigenous system of medicine(16)
78) Write a note on Basic concept and scope of Pharmacognosy.
79) Write a note on History and development of Pharmacognosy.
80) Give history and development of Pharmacognosy.(6)
81) Explain in brief the historical development of Pharmacognosy. 16
82) Give brief explanation on significance of Pharmacognosy in various system of medicine. 16
83) Define Pharmacognosy and give its scope. 8
84) Discuss briefly about the Ayurveda system of medicine. 8
85) Describe briefly the five pharmacological principles of drug which are Ayurvedic therapeutic based. 8
86) Define Pharmacognosy and crude drug and give the scope of Pharmacognosy.8
87) Write a note on basic concept and scope of Pharmacognosy. 4
88) Give significance of Pharmacognosy in various system of medicine.
89) Write a note on Modern concept of Pharmacognosy
90) Comment " Ayurveda- Indian system of medicine" 4
91) Write a detail account of Homeopathy and Aroma therapy. 16
92) Discuss about Historical development and significance of Pharmacognosy. 8
93) Give the detail account on Ayurveda 8
94) Discuss Homeopathy and Chinese as alternative system of medicine.16
95) Define the term Pharmacognosy. Discuss the scope of Pharmacognosy and give detail account of Ayurveda system of medicine. 6
96) Explain in brief historical development of the Pharmacognosy. 6
97) Explain in brief Traditional and Alternate system of medicine. 6
98) Discuss pharmacological classification of crude drugs with examples. (5 M)
99) Write a short note on alphabetical classification Aromatherapy.(5M)

100) Define adulteration, substitution and evaluation; write types of adulterants with examples. (5 M)

101) Define adulteration. Explain the different type of adulteration with suitable examples. (5 M)

102) Enlist various methods of classification of crude drug. Explain about the morphological and taxonomical classification of crude drug. (5M)

103) Differentiate between organized and unorganized crude drug. (4M)

104) Define adulteration describe the types of adulteration with its evaluation parameter. (8M)

105) Define crude drug .Explain alphabetical, morphological and chemical classification of crud drugs with examples. (5M)

106) Explain different system of classification of crude drugs with their merit and demerit.(16M)

107) Write a note on adulteration. (4M)

108) What are organized and unorganized crude drug. Explain alphabetical and chemical classification of crude drug with examples. (16M)

109) Write a note on type of adulteration. (8M)

110) Enlist various method of classification of crude drugs. Explain about morphological and taxonomical classification of crude drugs. (12M)

111) Classification of crude drug on the basis of alphabetical classification. (8M)

112) What is crude drug? Explain chemical and morphological classification of crude drug.
(8M)

113) Write in brief about therapeutic classification. (8M)

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PHYSICAL PHARMACY –I

16 Marks Question

1. Explain non Newtonian type of flow with rheograms, mechanism and suitable examples.
2. Define thixotropy. Give detail account on different types of thixotropic curve, mechanism for their behavior & measurement of thixotropy with suitable example.
3. Describe in detail different type of inclusion complexes with suitable example & explain any two methods for determination of complexes.
4. Define micromeritics. Give detail account on determination of particle size in powder using Anderson pipette & coulter counter apparatus.
5. Explain about micelle formation & its factors affecting micelle formation.
6. Discuss various methods to determine particle size.
7. Giving examples state differentiates between one point & multiple point viscometers. Give details on capillary & falling sphere viscometer.
8. Describe in detail about classification of surfactant.
9. Enlist different methods for determination of particle size. Explain coulter counter technique.
10. Describe in details about methods of Analysis of complexation
11. Illustrate property of SAA at interface in detail. Derive Gibb's adsorption equation.
12. What is fundamental & derived properties of powder sample? Describe methods used for determination of surface area of powdered sample.
13. Describe the use of Andresen equation in calculation of average particle size. Describe one method used for determination of particle surface area.
14. Give the importance of micromeritics in Pharmacy. Discuss various fundamental properties of particle. How particle size is determined by sedimentation process?
15. Explain about micelle formation & its factors affecting micelle formation.
16. Discuss various methods to determine particle size.
17. Give the classification of SAA, based on its chemical structure with suitable examples.
18. Justify the statements
    - Surfactants are used as antimicrobial agents.
    - Values of porosity practically exist beyond theoretical limits.
    - Dilatants & antithixotropic system differ from each other.
    - Micelle formation results in decrease in free energy.
19. Describe use of Edmundson equation in calculation of average particle size. Describe one method used for determination of particle surface area.

20. What is Newtonian & non newotonain flow behavior? Define thixotropy, antithixotropy & rheopexy. Elaborate in detail measurement & applications of thixotropy in pharmacy.
21. Describe detail different type of inclusion complexes with suitaible example and explain any two methods for determination of complexes
22. Define Micromeritics, give detail account on determination of particle size in powder using Andresen pipette method and coulter counter apparatus.
23. What is complexes? Giving examples, classify different types of complexes? Describe each class in short.
24. Give the importance of micromeritics in Pharmacy. Discuss various fundamental properties of particle. How particle size is determined by sedimentation process?
25. Giving examples state differentiates between one point & multiple point viscometers. Give details on capillary & falling sphere viscometer.
26. Define thixotropy. Give detail account on different types of thixotropic curve, mechanism for their behavior & measurement of thixotropy with suitable example
27. Give methods for determination of particle size. Write in detail about particle volume measurement.
28. Write a short notes on (any two)
    a. Micelle solubilization
    b. Application of surfactants
    c. Cup & bob viscometer
    d. Classification of complexes
    e. Sieving method
    f. Average particle size.
    g. Chemical factors affecting Rheology
29. Discuss following rheological properties of non-Newtonian materials.
    a) Plastic flow b) Pseudoplastic flow c) Dilatants flow d) Thixotropy

30 Explain following (any four)

    i. Effect of electrolytes on micelle formation.
    ii. Effect of temperature on micelle formation
    iii. Effect of electrolyte on flocculation
    iv. Rheopexy & antithixotropy.
    v. Effect of non- electrolyte on micelle formation.
    vi. True volume of powder sample

31 Solve any four from following i)

Describe role of thixotropy in formulation.

ii) Define diffusion. Explain importance of diffusion in Pharmacy.

iii) Compare characteristics of flocculated & deflocculated suspension.

iv) How does complexation influence drug action? Explain with help of suitable examples.

v) Explain about HLB Scale system.

32 Solve following

i. Describe HLB & classification of surfactant bases on HLB.

ii. Explain angle of repose & compressibility index.

33 Explain following (any four)

i. Write a short notes on plug flow

ii. Edmundson equation for average particle size.

iii. Define porosity? Write an application of micromeritics in production of dosage form

iv. Define complexes. Give its application in pharmacy.

v. Explain monomolecular inclusion complexes.

vi. State Newton law of flow.

vii. Bulge & spurs in hysteresis loops.

34 Solve any four

i. Define complexes. Give its application in pharmacy.

ii. Explain factors affecting solubilization

iii. Explain air permeability method for determination of surface area.

iv. Define micrometrics. Give its application in pharmacy

v. Define diffusion. Give its application in pharmacy.

vi. Give derived properties of powder.

35 Write short notes on (any four)

i. Falling sphere viscometer

ii. Plug flow

iii. Metal ion complex

iv. Inclusion compounds

v. Cone & plate viscometer

vi. Cub & bob viscometer

vii. Measurement of thixotropy

viii. Optical microscopy

36 Write short notes on (any four)

a. Metal complexes

b. Derived properties of powder

c. Cup & bob viscometer

d. Air permeability method for determination of surface area.

e. Newtonian system

f. Flocculated & deflocculated suspension
g. Angle of repose
h. Micelle formation
i. Particle size & distribution

10 Marks Question

1. With relevant mathematical equation, give the construction, working and applications of cup and bob viscometer. What are its disadvantages?
2. Define thixotropy, antithixotropy. Describe methods for measurement of thixotropy.
3. Write short notes on derived properties of powder.
4. Explain about methods used for powder surface area.
5. Write in detail about steady state diffusion.
6. Describe in details about micelle solubilization & its application.
7. Explain phenomenon of controlled flocculation in flocculated suspension.
8. Write short notes on derived properties of powder.
9. Explain following meaning
   Kinematic viscosity
   Specific viscosity
   Relative viscosity
   Intrinsic viscosity
   Bulge & spur

8 Marks Question

1. Thixotropy indicates gel- sol- gel transformation, while negative thixotropy indicates sol- gel –sol transformation. Justify
2. Explain the plastic and pseudoplastic flows curves with examples. What are the reasons for such a behavior?
3. Describe phenomenon of micelle formation with different factors affecting micelle formation.
4. What are surface active agents? Classify them on different basis. Give application of SAA.
5. Define thixotropy, antithixotropy. Describe method for measurement of thixotropy.
6. Describe in details about derived properties of powders.
7. Describe methods used for determination of particle volume.
8. What is micelle solubilization? How it is affected by various factors?
9. What is surfactant? Discuss factors affecting micelle formation?

10. Describe solubility method for determination of complex formation
11. Explain organic molecular complexes.
12. Explain sedimentation behavior of suspension through potential energy curves & give various factors which influence sedimentation.
13. Describe diffusion controlled release of matrix type formulation with Higuchi model.
14. Define true density, granule density, bulk density. Explain method for determination of true volume of powder.
15. Define specific surface. Explain air permeability technique for determination of surface area of powdered samples.
16. Explain method of analysis of complexes.
17. Explain sedimentation behavior of suspension through potential energy curves & gives various factors which influence sedimentation.
18. Explain physical factors affecting rheology of dispersed system
19. Explain non Newtonian flow patterns
20. Describe in details about HLB Scale.
21. Write in brief about Fick's second law of diffusion.
22. Write in details about factors affecting solubilization.
23. Define thixotropy. Describe working principle, advantages & disadvantage of cup & bob viscometer.
24. Describe electrical properties of double layer (DLVO theory)
25. Describe two instruments used to measure viscosity of non- Newtonian fluid.
26. Define stability constant & stoichiometric ratio for complex formation. How are determined by PH titration method.
27. Define thixotropy antithixotropy and rheopexy .describe .mid used for measurement of thixotropy what are application of thixotropy?
28. Explain organic molecular complexes?
29. Explain method of analysis of complexes?
30. Elaborate electrical properties of interface
31. Cup and Bob viscometer with advantage and disadvantages
32. Explain formulation of suspension.
33. Define true density, granule density, bulk density. Explain method for determination of true volume of powder.
34. What are surfactants? How are they classified? Give significance of micelle solubilization.
35. Describe solubility method for determination of complex formation
36. Describe two instruments used to measure viscosity of non- Newtonian fluid.
37. Explain physical factors affecting rheology of dispersed system

38. Explain sedimentation behavior of suspension through potential energy curves & gives various factors which influence sedimentation.
39. Describe the phenomenon of micelle formation with different factors affecting micelle formation
40. Explain characteristics of powder –particle size and particle shape
41. Short note on i)wetting agent ii)evaluations of suspension
42. Explain the phenomenon of controlled flocculation in flocculated suspension
43. Define micromeritics& explain conductivity method of particle size determination?
44. Explain adsorption & air permeability method.
45. Discuss in detail about evaluation of suspension.
46. Explain method of analysis of complexes.
47. Define specific surface. Explain air permeability technique for determination of surface area of powdered samples.
48. What is micelle solubilization? How it is affected by various factors?
49. What is surfactant? Discuss factors affecting micelle formation?
50. Describe primary properties of powder. Enlist method for determination of particle size.
51. Explain sedimentation behavior of suspension through potential energy curves & give various factors which influence sedimentation.
52. Describe phenomenon of micelle formation with different factors affecting micelle formation.
53. Describe the process of micellar solubilization; explain its application in pharmacy with suitable example.
54. What are various solvent solute interactions for solubilization? Explain them with suitable examples.
55. Explain in brief about diffusion controlled release- Higuchis equation.
56. Describe process of micellar solubilization. Explain its application in Pharmacy with suitable examples.

6 Marks Question

1. Plastic flow can be adequately described by plastic viscosity. Explain.
2. Yield value will be high in flocculated suspension and nil in deflocculated suspension. Why?
3. The viscosity of pseudoplastic system cannot be expressed by a single value. Why?
4. Why in cup and bob viscometer, the largest bob should be used?
5. Explain the terms ‘shear thinning’ and ‘shear thickening’ systems. Give one example for each type of material.
6. Define diffusion & give its application in pharmacy.
7. What is suspension? Give its advantages & ideal characteristics of suspension.

8. Give the working principal of cup and bob viscometer with a labelled diagram.
9. Draw the flow curves for Newtonian and non Newtonian types of flow. Give one examples for each type of flow.
10. Define micromeritics & give its application.
11. Differentiate between deflocculated suspension & flocculated suspension
12. Write the principal and working of Ostwald viscometer.
13. Explain the true density and bulk density
14. Explain optical microscopy method

4 Marks Question

1. The higher the viscosity of a liquid, grater is the shearing stress required for a given rate of shear. Justify.
2. Shear stress is measured in units of poise. Justify.
3. For Newtonian fluids, the slope of rheogram is 1(one). Explain.
4. Why thixotropy is a desirable property in pharmaceutical coarse dispersion system?
5. What is meant by plug flow? What is it due to?
6. What is meant by rheology? Describe its applications.
7. Define Newtonian flow. Give two examples.
8. When methylcellulose is added to water, the viscosity increases? Why?
9. Describe the importance of spur value in formulation of sustained release medication.
10. Draw the flow curve for antithixotropic flow and explain its mechanism.
11. Define complexes .give its application in pharmacy?
12. Define a)Thixotrophy b)Rheopexy c)Micromeritics d)Rheology
13. Define diffusion, enlist applications of diffusion.
14. Explain the Structure of micelle and liquid crystals
15. Explain the Density of powder
16. Explain the Ficks first law of diffusion
17. Define Micromeritics and give its applications in pharmacy.
18. Define following terms(Any four)
    a. Rheology
    b. Specific viscosity
    c. Reduced viscosity
    d. Kinematic viscosity
    e. Rheopexy
19. Differentiate between Emulsion and Suspension.

2 Marks Question

1. Relative viscosity is a dimensionless number. Explain.
2. Define thixotropy. Draw a thixotropic curve for a plastic flow.
3. Give the advantages of cone and plate viscometer over cup and bob viscometer.
4. How do you select a viscometer to study the rheology of fluids?
5. What is meant by yield value?
6. What types of viscometers are necessary for the study of non Newtonian fluids? Why?
7. Define intrinsic viscosity.
8. Define sedimentation volume & degree of flocculation.

PHARMACEUTICAL ORGANIC CHEMISTRY-I

Question Carries 4 Marks

1. Define ionic and covalent bond with suitable examples.
2. Give difference between inter and intra-molecular forces with examples.
3. Explain the term chemical bond and describe various types of it.
4. What do you mean by polarity of bond? Add a note on dipole moment?
5. What are polar and non-polar bonds?
6. Write note on $sp_3$ hybridization.
7. Explain the term geometric isomerism with suitable examples.
8. Boiling point of water is greater than ethyl alcohol, explain.
9. Define hybridization. Explain $SP_2$ hybridization.
10. Explain the term electro-negativity.
11. Justify HCl has smaller dipole moment than HF
12. Why tertiary carbocation is more stable one?
13. 9.67 mg of methane give 26.53mg of $CO_2$ and 21.56mg of $H_2O$ after combustion. Calculate percent composition.
14. Explain the term electronic configuration with Pauli's exclusion principle.
15. Give the structural formula and IUPAC name of the molecular formula $C_5H_{12}$ and $C_6H_{14}$
16. Explain why alkanes are relatively un-reactive.
17. Write reaction mechanism for chlorination of methane.
18. Justify the order of reactivity of halogen toward methane is $F_2>Cl_2>Br_2>I_2$
19. Explain the orbital structure of methane.
20. Explain the term pyrolysis.
21. Write about ozonolysis reaction.
22. Why $\pi$ bond is weaker than $\sigma$ bond?
23. Explain in detail geometrical isomerism.
24. Write a note on Markovnikov rule.
25. Write a note on peroxide effect.
26. What is hydroboration give example?
27. Give the general mechanism electrophilic addition reaction.
28. Why iodination does not takes place in methane?
29. Explain the term :
    i) Angle strain
    ii) Steric strain
    iii) Atomic orbitals
    iv) Bond dissociation energy
30. Explain the orbital picture of acetylene
31. Explain, how double bond is form in ethylene?
32. Give the synthesis of
    i) β-naphthol
    ii) Picric acid
33. Discuss the reaction mechanism of-

Phenol + chloroform $\xrightarrow{\text{aq. NaOH}}$ salicylaldehyde

34. Write the structures of the following:
    i) 3-iodo2,2-dimethyl butane
    ii) 1,1-dimethyl cyclopentane
35. Structures and IUPAC names of
    a) Phenol
    b) Catechol
    c) β-naphthol
    d) Resorcinol
    e) Hydroquinone
36. Explain Fries rearrangement in phenol.
37. Why phenol is stronger acid than ethyl alcohol.
38. Write a note on Kolbe reaction.
39. Write a note on Reimer-Tiemann reaction.
40. Give the synthesis of salicylic acid and salicylaldehyde.
41. What are cycloakane? How are they prepared?
42. How can cyclohexane be prepared using diels-alder reaction.
43. How will you detect carbon and hydrogen in organic compound?
44. How will you detect nitrogen, halogen and sulphur in organic compound?
45. Write about Dumas method of elemental determination.

Question carries 8 marks

46. Write in detail about intermolecular and intramolecular forces
47. Explain: covalent bond, Pi-bond, sigma bond and ionic bond.
48. Define hybridization, explain in detail sp2 and sp3 hybridization of carbon.
49. What is conformation? Write in detail about the conformation of n-butane.
50. Explain the halogenations of alkane with mechanism and orientation.
51. Write short note on – (4x2=8)
    i) Ozonolysis
    ii) Pyrolysis
    iii) Combustion
52. Give the method of preparation of Organometallic compound and give its significance in the synthesis of alkane.
53. Give at least four reactions of alkene with suitable examples.
54. How are alkanes prepared? Describe their important reaction.
55. Write a note on halogenations of alkene.
56. Write a note on conformation of alkane.
57. Discuss about conformation of ethane.
58. Discuss about conformation of n-butane.
59. What is Grignard reagent? Explain the reaction of it.
60. Write about ozonolysis.
61. What happens when propene is treated with hydrogen bromide in presence of peroxide? (6M)
62. Give the mechanism of addition of HBr to propene in absence of peroxide? (6M)
63. Give the detail note on dehydrohalogenation of alkyl halide in preparation of alkene.
64. What is 1, 2-Elimination? Explain in detail the E2 mechanism with all its evidences.
65. Explain in detail the reactions of alkane.

66. Explain in detail the uni-molecular elimination with all its evidences.
67. Explain in detail electrophilic addition reaction with orientation and reactivity.
68. Explain in detail Markovnikov addition and anti-Markovnikov addition with example.
69. What are alkynes? Give the methods of preparation and reactions of alkyne.
70. Explain why phenols are more acidic than alcohols?
71. Write in brief about: a) Kolbe's reaction b) Riemer-tiemann reaction
72. Discuss stability of cyclohexane on the basis of Bayer's strain theory.
73. Write a note on factors affecting on stability of conformation.
74. Explain in detail about Kjeldahl method for determination of nitrogen
75. Explain in detail about the method for determination of halogen.
76. Explain in detail Dumas method for estimation of nitrogen.
77. Explain in detail the method for estimation for carbon and nitrogen.
78. Explain, how halogen are estimated in organic compound?

Questions carry 16 marks

79. What happens when ethyl is treated with (any four)
    i) $Br_2/CCl_4$
    ii) Dil. $H_2SO_4$
    iii) Cnc.$H_2SO_4$
    iv) Dil. Cold $KMnO_4$
    v) $O_3$then Zn/H2O
80. Give a detail account on bimolecular elimination reaction along with all the evidences for proving the mechanism.
81. A) Describe, draw and explain about various types of conformation of the cyclohexane including factors affecting stability of conformation.
    B) Discuss about the Baeyer's strain theory.
82. Explain with suitable example, orientation and mechanism of Markovnikov's and antimarkovnikov's addition.
83. Give the synthesis of-
    i) Picric acid
    ii) Salicylic acid
    iii) Salicylaldehyde
    iv) β-Naphthol.
84. Short note on any two-
    i) Electrophilic addition in alkene
    ii) Unimolecular elimination
    iii) Free-radical addition
85. Explain keto-enol tautomerism. Write any two methods for preparing alkynes with examples. Give the different techniques of analysis of alkyne.
86. Explain the mechanism and evidences of unimolecular elimination ($E_1$) reaction of alkenes.
87. a) What is hybridization Explain in detail the types of hybridization giving suitable examples.
    b) Combustion of 7.81 mg of compound gave 24.56 mg of carbon dioxide and 10.03 mg of water. Calculate the percentage composition, empirical formula and molecular formula of the compound if its molecular weight is 84.
88. Define phenol; give the methods of preparation and reactions of phenol.
89. Explain in detail Markovnikov rule and peroxide effect with their reaction and mechanism.

90. Explain in detail the reaction for detection and estimation of C, H, N and halogen elements.
91. Explain the following
    a) Halogenation of alkane
    b) Cracking of alkane
92. What is mean by elimination reaction? Differentiate between E1 and E2 reaction. Explain mechanism, stereochemistry of E2 reaction.
93. Discuss the mechanism, stereochemistry and other aspects of chlorination of methane in detail.
94. Explain the term conformation. Give detail account on conformation of cyclohexane.
95. Explain in detail about the preparation and reactions of alkene.

# PHARMACEUTICAL ANALYSIS - I

## Question of 2 Marks

Define the term-

1. Molarity,
2. Molality,
3. Normality,
4. Standardization,
5. Equivalent Weight,
6. Accuracy,
7. Precision,
8. Primary Standard,
9. Secondary Standard,
10. End-Point,
11. Assay,
12. Stoichiometric Point,
13. Titration,
14. Titer,
15. Titrant,
16. Error,
17. Saturation,
18. Super-saturation,
19. Digestion,
20. Neutralization,
21. Indicator,
22. Pharmaceutical Analysis,
23. Buffer Solution,
24. Law Of Mass Action,
25. Leveling And Differentiating Effects Of Solvent,
26. Precipitation Titration,
27. Neutralization Titration,
28. Precipitating Agents,
29. Solubility Product,
30. Solubility,
31. Complexometric Titration,
32. Complexing Agent,
33. Co-Ordination Number,
34. Masking Agents And Demasking Agents,
35. Oxidation-Reduction Reaction,
36. Redox Titration,
37. Redox Potential,
38. Oxidizing Agent,
39. Reducing Agent,

40. Iodimetry,
41. Iodometry,
42. Gravimetric Analysis,
43. Tyndall Effect,
44. Surface Adsorption,

Question of 4 Marks

45. Define and explain the terms Accuracy and Precision,
46. Define and explain the terms Primary standard and Secondary standard
47. Define and explain the terms Saturation, Super-saturation, Digestion
48. Define Pharmaceutical Analysis and give its applications
49. Classification of Pharmaceutical Analysis
50. Differentiate between chemical method and instrumental method of analysis
51. Write in detail about primary and secondary standard.
52. How will you determine and minimize errors in analysis (accuracy and precision)?
53. Write a detail note on types of acid-base.
54. Write a detail note on pH, buffer solution with examples.
55. Write a detail note on law of mass action
56. Why and how buffer solution resist the change in pH?
57. Why and how indicator give colour change near equivalence point?
58. Write a detail note on theory of acid-base behavior
59. what is the pH of end-point when strong or weak electrolytes of acids or bases reacts?
60. method of preparation and standardization of HCL,
61. method of preparation and standardization of NaOH,
62. assay of Ammonium chloride,
63. assay of aspirin,
64. assay of boric acid.
65. write a note on acid base characters of solvent,
66. write a note on leveling and differentiating effects of solvent
67. method of preparation and assay of Perchloric acid in glacial acetic acid,
68. method of preparation and assay of Perchloric acid in dioxane,
69. method of preparation and assay of lithium methoxide,
70. method of preparation and assay of sodium methoxide,
71. method of preparation and assay of tetrabutyl ammonium hydroxide,
72. write down the applications of non-aqueous acid-base titration.
73. Write a detail note on factors affecting solubility of precipitate
74. what is fractional precipitation?
75. Mohr's method (direct);
76. Volhard's method (back);
77. Fajan's method (adsorption);
78. Gay-Lussac method (turbidity),
79. method of preparation and standardization of silver nitrate,
80. method of preparation and standardization of ammonium thiocynate,
81. method of preparation and standardization of mercuric nitrate,
82. method of preparation and standardization of sodium chloride,
83. method of preparation and standardization of potassium chloride,

84. write a note on mercurometric titration with example.
85. justify, buffer solution is added in complexometric titration,
86. what is the principle of complexometric titration?
87. EDTA is a versatile complexing agent, Justify,
88. what are metallochrmic indicators give examples?
89. write a note on instrumental method of end-point detection in complexmetric titration.
90. write a note n masking and demasking agents with examples.
91. Give the applications of complexometric titration.
92. method of preparation and standardization of EDTA.
93. method of preparation and standardization of Lead nitrate.
94. Define and explain about oxidizing agent (oxidant), reducing agent (reductant).
95. “stronger the oxidizing agent, weaker is its reductant and vice-versa”, Justify.
96. Write a detail note on Redox potential.
97. Give a detail accoutnt on iodimetry and iodometry.
98. Discuss the methods of writing oxidation-reduction reaction.
99. why potassium permanganate is act as its own indicator?
100. define equivalent weight of oxidizing agent and reducing agent and give its method of determination.
101. give the principle of permanganate titration
102. give the method of preparation and standardization of potassium permanganate
103. why starch is added just before the end point?
104. method of preparation and standardization of sodium thiosulphate and iodine solution
105. write a note on dichromate titration and give method of preparation and standardization of potassium dichromate solution,
106. what do you mean by cerriometry? Give advantages of ceric sulphate as an oxidizing agent
107. method of preparation and standardization of ceric ammonium sulphate solution
108. write a note on factors affecting precipitation.
109. write a note on factors affecting surface adsorption
110. write a note on precipitating agent with their examples,
111. what is difference between lyophobic and lyophilic colloids?
112. what are the characteristic properties of colloids?
113. what affect the stability and unstabilility of colloids?

Question of 8 marks

114. Define Pharmaceutical Analysis and give its classification and applications.
115. Write in detail about mixed indicator, universal indicator, neutralization indicator
116. Discuss in detail end-point detection methods of neutralization titration.
117. write in detail about neutralization curve with its conclusion.
118. Write a detail note on types of acid-base, pH, buffer solution.
119. Give a detail account on Henderson-Hasselbalch equation.
120. Write in detail about acid-base equilibrium and law of mass action.
121. Give method of preparation and standardization of HCL, NaOH and assay of aspirin
122. write a note on properties of solvent to be used in non-aqueous acid-base titration.
123. write a note on acid base characters of solvent, leveling and differentiating effects of solvent.
124. method of preparation and assay of Perchloric acid in glacial acetic acid and lithium methoxide.

125. write a note on acid base characters of solvent and give applications of non-aqueous acid-base titration
126. Define precipitation titration and give a detail account on precipitating agents with examples.
127. Define solubility product and expain factors affecting solubility of precipitate.
128. what is fractional precipitation? Write about calculation of solubility and solubility product
129. write in detail about any two methods of end point detection in precipitation titration
130. Give the method of preparation and standardization of silver nitrate and assay of sodium chloride.
131. write a note on mercurometric titration with example. Give the assay of mercuric nitrate
132. give the principe of complexometric titration and write a note on complexing agent.
133. What is co-ordination number? Justify, “EDTA is a versatile complexing agent.”
134. write in detail about methods of end point detection in complexometric titration.
135. write in detail the types of titration involved in complexometric titration.
136. write a note n masking and demasking agents with examples. Give applications of complexometric titration.
137. Define complexometric titration, give the principle of complexometric titration and method of preparation and standardization of EDTA.
138. write a detail note on iodine titration and write down the conditions for iodometric determination.
139. Write about method of preparation and standardization of sodium thiosulphate and iodine solution.
140. define equivalent weight of oxidizing agent and reducing agent and give its method of determination.
141. Define Redox Titration. what do you mean by half reaction in redox titration?
142. Define oxidation-reduction reaction and Redox Titration. Give a detail note on Redox potential.
143. discuss the methods of writing oxidation-reduction reaction.
144. write in detail about the methods of end-point detection in oxidation-reduction titration
145. write in detai about the principle of permanganate titration, give the method of preparation and standardization of potassium permanganate.
146. write a note on dichromate titration and give method of preparation and standardization of potassium dichromate solution.
147. Define gravimetric analysis and write a note on colloidal state.
148. Give the factors affecting precipitation, write a note on precipitating agent with their examples.
149. what are the characteristic properties of colloids, what affect the stability and unstabilility of colloids?
150. Write a note on conditions of precipitation and give a detail account on purity of precipitate.
151. write a note on filtration and types of filtration medias.
152. write a note on types of washing of precipitate.

Questions of 16 marks

153. Define Pharmaceutical Analysis, and give its detail classification and applications.
154. Give a detail account on theory of acid-base behavior, law of mass action. Discuss end-point detection methods of neutralization titration

155. Define neutralization curve, end point and indicator. write in detail about neutralization curve with its conclusion.
156. write in details about properties of solvent to be used in non-aqueous acid-base titration.
157. Discuss in detail acid base characters of solvent, leveling and differentiating effects of solvent, method of preparation and assay of Perchloric acid in glacial acetic acid.
158. Explain, why there is a need to use a solvent other than water? write a note on acid base characters of solvent and give applications of non-aqueous acid-base titration.
159. Define precipitation titration, solubility product. Discuss calculation of solubility and solubility product. Write about the factors affecting solubility of precipitate.
160. Give a detail account on methods of end point detection in precipitation titration-Mohr's method (direct); Volhard's method (back); Fajan's method (adsorption); Gay-Lussac method (turbidity)
161. Define complexometric titration, complexing agent. What is the principle of complexometric titration? Justify, "Buffer solution is added in complexometric titration".
162. Give a detail account on methods of end point detection in complexometric titration. Write a note on masking and demasking agents with examples.
163. write in detail the types of titration involved in complexometric titration. Give the applications of complexometric titration and method of preparation and standardization of EDTA.
164. What is oxidation-reduction reaction, Redox Titration, Redox potential? Discuss the methods of writing oxidation-reduction reaction
165. Write in detail about the methods of end-point detection in oxidation-reduction titration. Justify, why potassium permanganate is act as its own indicator?
166. Write a note on iodine titration and write down the conditions for iodometric determination. Why starch is added just before the end point? Give the method of preparation and standardization of sodium thiosulphate and iodine solution.
167. Give a detail account on steps involve in gravimetric analysis.
168. What is colloidal state? Differentiate between lyophobic and lyophilic colloids, what are the characteristic properties of colloids? What improves and affects the stability of colloids?
169. Write a detail note on conditions of precipitation, purity of precipitate.
170. Write a note on precipitating agent with their example. Discuss filtration and types of filtration media used in gravimetric analysis.
171. Write a note on precipitating agent with their example. Write a note on types of washing of precipitate.

# PHARMACEUTICAL MICROBIOLOGY AND IMMUNOLOGY-I

## 16 mark Questions

1. Explain methods for isolation of bacteria and add a note on bacterial growth.
2. Explain in details about methods used for isolation and preservation of bacteria.
3. Describe the structure of bacteria with the help of neat well labeled diagram.
4. Explain in details structure of bacterial cell and add a note on reproduction of bacteria.
5. Explain in detail method for isolation and identification of bacteria. Add a note on preservation of microbial culture.
6. Draw a structure of bacterial cell. And explain internal and external parts.
7. Draw a well labeled diagram of Bacterial cell explain various functions of different organelles.
8. Explain objective and methods for preservation of bacterial culture. Describe growth curve.
9. Draw a well labeled diagram of Bacterial cell and explain.
10. Write about etiology, pathophysiology, transmission, prevention and treatment of following diseases. 1. Tuberculosis 2. Leprosy 3. AIDS
11. What are viruses? Describe the structure of viruses and explain life cycle of phage virus.
12. What is pure culture? Describe in detail various methods of isolation and identification of bacteria.
13. Give in detail various methods for cultivation of viruses and describe multiplication cycle in viruses.

## 10 Mark questions:

1. Give lytic and lysogenic life cycle of bacteriophage.
2. Describe in detail the process of transformation, transduction and conjugation.
3. Explain viral reproduction and multiplication process.
4. What are two different life cycles of bacteriophage? Explain in details.
5. Explain isolation techniques of bacteria. Describe growth curve.
6. Explain in detail life cycle of bacteriophage.

8 Mark questions

1. Define Microbiology. Give application and scope of Pharmaceutical Microbiology.
2. Write in short about contribution of Paul Ehrlich in Microbiology.
3. Write in Detail about contribution of Louis Pasteur in the field of Microbiology.
4. Give reason, 'Why Louis Pasteur is called as Father of Microbiology.'
5. Write in detail about contribution of Robert Koch and Alexander Fleming in the field of Microbiology.
6. Explain in detail about shape and arrangement of Bacteria.
7. Draw a structure of Bacterial cell. Explain in details its external organelles.
8. Draw a structure of Bacterial cell. Explain in details its internal organelles.
9. Explain in detail growth curve of bacteria. How will you calculate number of generations and time require for each generation?
10. Enlist the different methods used for measurement of bacterial growth. Explain any one direct method used for counting.
11. Explain in details about the physical conditions required for the growth of bacteria.
12. Explain different techniques used for the preservation of cultures.
13. Explain the different methods used for isolation of culture.
14. Give objectives and methods for the preservation of bacteria.
15. How will you identify an unknown culture of bacteria?
16. Explain in detail about reproduction of fungi.
17. Explain in detail about different methods used for the cultivation of viruses.
18. Write a note on multiplication of viruses.
19. What are viruses? Give general properties of it. Add a note on Lytic life cycle of bacteriophage.
20. Explain Koch's postulate. What significant contribution did Koch make to the development of medical microbiology?
21. Describe process of sporulation and endospore formation.
22. Define the growth of bacteria. Describe the typical bacterial growth curve.
23. Describe the methods to determine the number of cells in a culture.
24. Describe the morphology, nutrition requirement and reproduction properties of fungi.
25. What is mutation? Explain in details types of mutation.
26. What is recombination? Describe different types of recombination process.
27. Discuss the concept of central dogma.
28. Explain different methods of cultivation of viruses.

29. Explain the contribution of Robert Koch and Alexander Fleming in the development of Microbiology.
30. Give the contribution of Louis Pasteur and Robert Koch in the field of Microbiology.
31. Explain various types of microscopes used in microbiology along with their applications and limitations.
32. Explain in detail the concept of recombination. Discuss in detail various recombination processes.
33. Explain different types of recombination in bacteria. Enlist different culture media used for the growth of bacteria.
34. Draw a well labeled diagram of structure of bacterial cell and explain in detail its internal organelles.
35. Draw a well labeled diagram of structure of bacterial cell and explain in detail its external organelles.
36. Enlist the various methods used for measurement of bacterial growth. Explain any one direct method used for counting.
37. Explain in details measurement of bacterial growth.
38. Explain various methods for the isolation of bacteria.
39. How will you identify the unknown culture of bacteria? Explain in details any one method.
40. Explain internal structure of bacterial cell.
41. Explain classification, nutrition and reproduction of Fungi.
42. Write general properties of viruses and give detail account of its structure.
43. Write in detail classification and cultivation of viruses.
44. Describe lytic growth cycle of bacteriophage.
45. What are viruses? Give different properties of viruses.
46. Write a note on lysogenic life cycle of bacteriophage along with neat labeled diagram.
47. Explain method for the isolation of bacterial culture and Objective of preservation of culture.
48. Explain various techniques for isolation of bacterial culture and describe growth curve.
49. Explain in detail the concept of recombination. Discuss in detail various recombination processes.
50. What is bacteriological media? Give classification and explain.
51. What are viruses? Give the various properties of viruses and draw the structure of phage virus.
52. Explain recombination in bacteria. Write a note on Replica plate technique.
53. Explain growth kinetics of bacteria.
54. Give size, shape and cell arrangement in bacteria.
55. Explain replication process in prokaryotic cell.

56. Name several applied areas of microbiology. Describe the importance of microorganisms in each of these applied fields.
57. Compare the appearance of microorganism as seen by dark field and by phase contrast microscopy.
58. What are the advantages and disadvantages of the various methods for preservation of pure culture?
59. Compare the advantages and disadvantages of the various techniques for the isolation of microorganism in pure culture.
60. Describe sexual reproduction as it occurs in fungi.
61. Describe three techniques for cultivating viruses in the laboratory. How do these methods differ from methods for culturing bacteria?

## 6 Mark questions

1. Explain in detail about compound microscope.
2. Elaborate in detail the normal growth cycle, synchronous growth and continuous growth of bacteria.
3. Explain in details about the shape and arrangement of bacteria.
4. Explain in detail protein synthesis in bacteria.
5. explain classification of fungi with suitable example.
6. Explain normal, continuous, synchronous growth of bacteria.

## 4 Mark questions

1. Write in details application and scope of pharmaceutical Microbiology.
2. Explain different types of microorganism.
3. Define Microbiology. Give classification of Bacteria.
4. Write a note on, Whittaker's Five Kingdom concept.
5. Write a note on Classification of Bacteria.
6. Write a note on Application of Microbiology.
7. Write in Detail about contribution of Robert Koch in the field of Microbiology.
8. Write in details about contribution of Antony Van Leeuwenhoek in the field of microbiology.
9. Write in detail about contribution of Alexander Fleming in the field of Microbiology.
10. Describe applications of Fluorescence microscopy.
11. Write about different types of microscopes.

12. Write the principle and applications of Transmission electron microscope
13. Write in detail about Dark field microscopy.
14. Write in detail about Scanning electron microscopy.
15. Explain in detail the different types of condensers used for Dark field microscopy.
16. Write a note on Scanning electron microscopy.
17. Write a note on Dark field microscopy.
18. Write a note on TEM.
19. Write a note on Fluorescence microscopy.
20. Write a note on applications of Dark field microscopy.
21. Write the classification of bacteria depending upon nutritional requirement with suitable example.
22. Write the classification of bacteria depending upon the arrangement of Flagella with example.
23. How will you detect motility of Bacteria? Explain structure of Flagella.
24. Explain in Detail structure of the cell wall of gram positive and gram negative bacteria.
25. Explain in detail about spores in bacteria by considering the following points: a) Types of spores b) Spore formation c) Spore germination
26. Write the classification of bacteria depending upon nutritional requirement.
27. Explain different types of media.
28. Define and classify Bacteriological media.
29. How will you cultivate anaerobic bacteria?
30. Write a note on Reproduction of bacteria.
31. Write a note on Synchronous growth.
32. Write a note on Continuous growth.
33. Write a note on Turbidimetric method.
34. What is the effect of Oxygen on growth of Bacteria?
35. Define and classify bacteriological media. Give details about the common ingredients used for the preparation of media.
36. Write a note on Streak plate method.
37. Write a note on pour plate method.
38. Explain in short, the classification of fungi.
39. Explain in detail about size, shape and morphology of viruses.
40. Write a note on bacteriophage.
41. Explain different types of spontaneous mutation.
42. Explain different types of induced mutation.
43. Describe the methods of isolation of mutants.
44. Describe the structure and the composition of virus. How will you classify viruses?

45. Write a note on Applications of microbiology.
46. Explain in short about different types of microorganism.
47. State application and working of Scanning Electron Microscopy.
48. What is bacterial transduction?
49. Differentiate between gram positive and gram negative bacteria
50. Note on Mutation and its types.
51. Note on mutagenic agents.
52. Differentiate between DNA and RNA.
53. Write salient feature of Replica plate technique.
54. Note on Transduction
55. Write a note on Spore germination
56. Define bacteriological media. Give classification of bacteriological media
57. Note on spread plate method.
58. Note on roll tube method.
59. Note on Pour plate method.
60. Describe the replication process in bacterial DNA
61. Note on Plasma membrane.
62. Discuss in detail properties of human viruses.
63. Note on bacteriophage.
64. Explain in detail about size, shape and morphology of viruses.
65. Explain in detail etiology, pathophysiology transmission prevention and treatment of TB
66. Explain in detail etiology, pathophysiology transmission prevention and treatment of Malaria.
67. Explain in detail etiology, pathophysiology transmission prevention and treatment of fungal infection.
68. Explain in detail etiology, pathophysiology transmission prevention and treatment of Typhoid.
69. Explain in detail etiology, pathophysiology transmission prevention and treatment of AIDS.
70. Explain in detail etiology, pathophysiology transmission prevention and treatment of Syphillis.
71. Explain in detail etiology, pathophysiology transmission prevention and treatment of Cholera.
72. Explain in detail etiology, pathophysiology transmission prevention and treatment of leprosy.
73. Explain in detail etiology, pathophysiology transmission prevention and treatment of Influenza.
74. Explain replication process in bacterial DNA
75. Give nutritional requirement of bacteria.
76. What are bacteria? Classify them on the basis of nutritional requirement.
77. Explain in short conjugation in bacteria.

78. Differentiate between prokaryote and eukaryote.
79. List various methods for isolation of bacteria. Explain any one of them.
80. What are Bacteria? Draw a well labeled diagram of structure of bacterial cell.
81. What is the basis of the five kingdom classification scheme according to Whittaker? Give a reason why it is so widely accepted in the biological community.
82. In what ways did Koch's postulates influence the development of microbiology?
83. Is spore formation in bacteria is a method of reproduction or a means of multiplication? Explain.
84. What is meant by central dogma of molecular genetics?
85. What is the difference between a naked and an enveloped virion.

PHARMACOLOGY – I

1) What is drug absorption? Explain the factors that influence it. (8M)
2) Classify anticholinesterases its mechanism action, adverse effect and therapeutic uses of reversible anticholinesterases. (16 M)
3) Write the classification of anticholinergic drugs and write its mechanism action, adverse effect and therapeutic uses. (16M)
4) Classify adrenergic receptors .Explain the mechanism action, therapeutic uses and adverse effect of Propranolol. (16M)
5) Write short note on any four. (16 M)
    a) Drugs used by Inhalation
    b) Therapeutic index
    c) Glaucoma
    d) Idiosyncrasy
    e) Atenolol
6) Write short note on any four. (16M)
    a) Redistribution
    b) Blood – brain barrier
    c) Placental barrier
    d) Clinical importance of plasma protein binding
    e) Prodrug
7) write briefly on any four.(16M)
    a) Drug synergism
    b) Placebo
    c) Receptor regulation
    d) Drug dependence
    e) Drug abuse

8) Define following terms. (8M)

    a) Pharmacology
    b) Pharmacokinetics
    c) Chemotherapy
    d) Drug potency

9) Classify adrenergic receptor and write storage, synthesis and release of adrenalin. (8M)

10) Write the types, distribution and function of adrenergic receptor. (8M)

11) Write the synthesis, storage and release of acetylcholine.(8M)

12) Explain in brief synthesis, storage and release of acetylcholine. (8M)

13) Write the types, distribution and function of cholinergic receptor. (8M)

14) Write the synthesis, storage and release of adrenalin. (8M)

15) Write the classification of adrenergic receptor. (8M)

16) Define following terms. (8M)

a. Agonist
b. Antagonist
c. Partial agonist
d. Inverse agonist

17) Write the types and treatment of glaucoma.(8M)

18) Write the drug therapy on myasthenia gravis. (8M)

19) Write a short note on neuromuscular blockers. (8M)

20) Define drug distribution and write its factors that influence it.(8M)

21) Define drug excretion and write its factors that influence it.(8M)

22) Define drug metabolism and write its factors that influence it.(8M)

23) Write in brief about drug excretion. (8M)

24) Write a difference between ANS and SNS. (4M)

25) Give the advantages and disadvantages of intravenous route of administration.(4M)

26) Write short note on idiosyncrasy. (4M)

27) Define pharmacology and explain its scope.(4m)

28) What is drug synergism.(4m)

29) Discuss the concept of neurohumoral transmission.(8M)

30) Write a note on types of drug action. (8M)

31) Explain in brief G- protein coupled receptor. (8M)

32) Explain in brief G- protein coupled receptor and write its types. (16M)

33) Write a short note on ligand -gated ion channel.(8M)

34) Explain the dose –response relationship with its clinical importance. (8M)

35) What are the types of adverse drug reaction? (8M)

36) Explain the general principles in the treatment of drug poisoning. (8M)

37) Write in brief non-dose related adverse drug reactions. (8M)

38) Explain the factors which affect the drug action. (8M)

39) Explain in brief which factors affect the drug action. (8M)

40) Write the various types route of drug administration and with their suitable example. (16M)

41) Explain various types of drug administration and with their advantages and disadvantages. (16M)

42) Mention the various route of drug administration. What are the advantages and disadvantages of oral, intravenous and sublingual route of drug administration (16M)

43) Explain transdermal route of drug administration. (8M)

44) Write the advantages and disadvantages of sublingual route of drug administration.(8M)

45) Write the drugs used by inhalation. (4M)

46) Write in brief pharmacogenetics. (8M)

47) Write about drug receptor interaction. (8M)

48) Describe the factors affecting physiological barriers. (8M)

49) Explain the phenomenon of biotransformation of drug. (16M)

50) Write about zero- order kinetics and importance of half life. (8M)

51) Write a detailed about on antimuscarinic agents and cholinomimetics. (16M)

52) Write short note on any two. (8M)

a) Amphetamine and Pilocarpine
b) Timolol and Atropine
c) Neuromuscular blocking agents

53) Write short note on Ganglionic blockers.(8M)

54) Write advantages and disadvantages of intramuscular route of administration.(4M)

55) Discuss the principles and application of pharmacokinetics. (8M)

56) Discuss the principles and application of pharmacotherapeutics. (8m)

57) Write a short note on any two. (8M)

a) Plasma half life
b) Bioavailability
c) Bioequivalence

58) Describe in brief about drug receptor interaction. Also add a note on factors modifying drug effects. (16 M)

59) Write a note on neurohumoral transmission. (8M)

60) Explain the concept of cholinomimetics. (8M)

61) Explain pharmacological mechanism of action and use of adverse drug reaction. (16M)

62) Describe the molecular and biochemical aspects of drug action receptors. (16M)

63) Write a note on any two. (16M)

a) Neuromuscular blocking agents
b) Factors affecting physiological barriers
c) Excretion of drug

64) Given detail account on transducer mechanism.(16M)

65) Given detail account on G- protein couple receptor. (16M)

66) Write short note on any two. (16 M)

a) Transdermal route of drug administration
b) Advantages and disadvantages of sublingual route
c) Drug used by inhalation

67) Define pharmacology and write its scope. (4M)

68) What is a drug bioavailability? Explain the factors affecting it with suitable examples. (16M)

68)Write briefly on. (8M)

a) First – pass effect
b) Facilitated diffusion

69) Write briefly on clinical importance of plasma protein binding. (16M)

70) What is biotransformation? Explain the process involved in biotransformation. (16M)

71) Write short note on ant two. (8M)

A. Factors affecting biotransformation
B. Enzyme induction and its clinical importance
C. Pharmacogenetics

72) Define prodrug and write its application. (4M)

73) Define biotransformation? Explain in detail its pathway. (16M)

74) Explain four methods to prolong the duration of action of a drug with suitable examples. (16M)

75) Write briefly on therapeutic drug monitoring. (8M)

76) Define pharmacodynamics and write its types of drug action. (8M)

77) ) Define pharmacodynamics and write briefly on mechanism of drug action.(8M)

78) Explain various types of drug antagonism with suitable examples. (16M)

79) Explain four pathological factors that affect drug response with suitable examples. (16M)

80) Explain the factors which affect the drug action. (8M)

81) Explain the dose response relationship with its clinical importance. (8M)

82) Define adverse drug reaction and write its types. (8M)

83) Explain the general principles in the treatment of drug poisoning. (8M)

84) Write short note on any two. (12M)

a) Type – I hypersensitivity reaction
b) Drug dependence
c) Idiosyncrasy

85) Define and Explain adverse drug reaction. (8M)

86) Write a short note on teratogenecity. (4M)

87) What is a receptor? Describe G – protein coupled receptor and its transducer mechanism. (16M)

88) Explain different route of drug administration with example. Write advantages and disadvantages of intravenous and sublingual route of drug administration. (16M)

89) Classify the different type of adrenergic receptors. Explain the pharmacological action, therapeutic uses, adverse effect and contraindication of adrenalin. (16M)

90) Classify anticholinergic drugs. Explain the pharmacological action, uses and adverse effect of atropine. (16M)

91) Classify β- blockers. Explain the mechanism of action, uses and adverse effect of Propranolol. Comment on contraindication of Propranolol. (16M)

92) Explain anticholinesterases its mechanism of action, adverse effect and therapeutic uses of reversible anticholinesterases. (16M)

93) Write a short note on any four. (16M)

a) Neuromuscular blockers
b) Dopamine
c) Labetalol
d) Myasthenia gravis
e) Placebo

94) Define pharmacokinetics, toxicology, drug, chemotherapy and pharmacodynamics. (4M)

95) Mention the factors that affect drug distribution. (8M)

96) Define biotransformation and classify various types of biotransformation reactions.(16M)

97) Define distribution and redistribution. Explain the factors that influence it. (8M)

98) Define excretion. Explain various channels of excretion. Write about renal excretion in detail. (16M)

99) Describe the principle and mechanism of drug action receptors. (8M)

100) Define drug absorption, bioavailability of the drug. Explain the factors that influence drug absorption. (16M)

101) Define distribution, apparent volume of distribution. Explain the factors that influence it. (16M)

102) Solve any two from following. (16M)

a) Explain kinetics of elimination
b) Describe various physiological barriers
c) Explain G - protein coupled receptors

103) Solve any three from following. (16M)

a) Synthesis acetylcholine
b) Classification of nervous system
c) Why adrenalin is preferred as life saving drug
d) Synthesis of catecholamine

104) Classify anticholinergic drugs. Explain pharmacological action , uses and adverse effect of proto type drugs. (16M)

105) Write in brief about drug excretion. (8M)

106) Give detail account on drug interaction. (8M)

107) Explain the phenomenon of biotransformation of drugs. (8M)

108) Write the therapeutic classification of adrenergic drugs. (8M)

109) Explain the factors affecting or modifying drug effects. (8M)

110) Write about zero - order kinetics and importance of half life. (8M)

111) Write a detailed account on antimuscarinic agents and cholinomimetics. (16M)

112) Write note on any two. (16M)

1. Amphetamine and pilocarpine
2. Timolol and atropine
3. Neuromuscular blocking agents

113) Describe in brief about drug receptor interaction also add note on factors modifying drug effect. (16M)

114) Discuss the principle and application of pharmacokinetics. (8M)

115) What are steps involved in neurohumoral transmission. (8M)

116) Write note on any four. (8M)

a) Dopamine
b) Amphetamine
c) Dobutamine
d) Timolol

e) Atropine

117) Explain the concept of cholinomimetics. (6M)

118) a) Describe the molecular and biochemical aspects of drug action receptors. (10M)

b) Write about idiosyncrasy (6M)

119) Write note on factors affecting physiological barriers. (8M)

120) Solve any four. (16M)

1) Write about the scope of pharmacology
2) Explain the advantages and disadvantages of parenteral route of drug administration
3) What do you mean by drug absorption
4) Write a note on passive diffusion
5) Explain about drug synergism

121) Classify cholinergic and adrenergic receptors. (8M)

122) What are different signaling mechanism of cellular communication. Explain in detail about receptor. (16M)

123) Write various therapeutic alternatives for the treatment of myasthenia gravis. (6M)

124) 1) Write detail about biotransformation. (10M)

2) What are adrenergic drugs? Give their therapeutic significance. (6M)

125) a) Classify anticholinesterases. Write down mechanism of action, pharmacokinetic profile and adverse reaction? Clinical application of anticholinesterases. (10M)

b) Write down various therapeutic alternatives for atropine. (6M)

126) Write short note on. (8M)

a) Ganglionic blockers

b) Muscle relaxant

127) Write a note on any two. (10M)

a) α adrenergic blockers
b) Drug excretion and renal clearance
c) Glaucoma

128) Write in brief mechanism of drug action. (16M)

129) Mention four cardio selective β blockers. Explain the action of Atenolol on heart. (8M)

130) Write short note on any two. (8M)

a) Ganglionic stimulant
b) Therapeutic uses of Atenolol

c) Ganglionic blocking

131) Classify α blockers. Explain the mechanism action, therapeutic uses and adverse effect of phenoxybenzamine. (16M)

132) Explain the pharmacological basis for the following. (8M)

a) Adrenalin in anaphylactic shock
b) Dopamine in carcinogenic shock

133) Answer the following. (8M)

i. Why atropine should be cautiously administered in elderly patients?
ii. Why atropine should be given prior to neostigmine in curare poisoning?

134) Outline the drug treatment of organophosphorus poisoning, and give the basis for their use. (8M)

135) Answer the following any two. (8M)

i. What is cholinergic crisis?
ii. List two differences between neostigmine and physostigmine
iii. Explain, why neostigmine is preferred to physostigmine in myasthenia gravis?

136) Explain the basis for alkalinization of urine in salicylate poisoning. (8M)

137) Explain in brief factors modifying drug action. (10M)

138) Explain four methods to prolong the duration of action of a drug with suitable examples. (8M)

139) Write short note on any two. (8M)

a) Therapeutic uses of α blockers
b) Anorectics
c) Botulinum toxin

140) Classify the skeletal – muscle relaxant with suitable examples. Explain the mechanism of action, therapeutic uses and the adverse effect of d- TC. (16M)

# HOSPITAL AND COMMUNITY PHARMACY

## 16 MARKS QUESTIONS

1. Define hospital; classify hospital and give the organization of hospital.
2. Describe the organization of hospital and health delivery system in India.
3. Define hospital, give the function of hospital describe hospital; describe hospital organization and health delivery system in India.
4. Define hospital pharmacy; give its objective, function, location and layout of hospital pharmacy.
5. Give location, layout, flow chart of materials, men, personnel, floor space requirements equipments for hospitals.
6. Describe inpatient drug distribution system in detail.
7. Describe outpatient drug distribution system in detail.
8. Describe in detail central sterile supply managements.
9. Give objective, function and organizational structure of central sterile supply department.
10. Give purpose organization, operation function and scope of pharmacy and therapeutic committee.
11. Define hospital formulary, needs for hospital formulary, benefits of drug formulary system and factors responsible for formulary system.
12. Describe enlist guidelines for hospital formulary, contents of formulary and its organization.
13. Give the procedure for preparation of formulary.
14. Explain in detail about various methods of sterilization.
15. Define community pharmacy, explain in detail how concept of community pharmacy developed In India, and give role of community pharmacist.
16. Give the need of drug information services, types of drug information centre and explain sources of drug information and function of drug information centre.
17. Explain detail drug information centre.
18. Explain types of drug distribution system.

## 8 MARKSQUESTIONS

19. Define hospital, how they are classified, give its organization and management system.
20. Describe organization of hospital and health delivery system in India.
21. What is hospital, classify it and explain health delivery system in India.
22. Define hospital pharmacy; give organization of hospital and management of hospital.
23. Define hospital pharmacy, give its function, objective and add note on location and layout of hospital pharmacy.
24. Explain role of hospital pharmacist hospital.
25. Describe location, layout, personnel and floor space requirements for hospital pharmacy.
26. Give flow chart for requirements and abilities of hospital pharmacist.
27. Give requirements and duties of hospital pharmacist in hospital.
28. Draw layout plan, location, flowchart of material and men in hospital in pharmacy.
29. Describe outpatient drug distribution system.
30. Describe in patient drug distribution system.
31. Describe in brief complete floor stock system.

32. Describe unit dose dispensing system.
33. Describe in brief management of central sterile supply department.
34. Give objective of sterilization, describe packing process for sterile products and explain method of sterilization.
35. Give types of drug information centre and describe its function.
36. Describe In detail drug information centre.
37. Explain role of computer in pharmacy
38. Explain medication errors.
39. Define hospital formulary and give need for hospital formulary.
40. Write short note on preparation of formulary.
41. Describe in detail hospital formulary system.
42. Explain in detail pharmacy and therapeutic committee.
43. Give the role of hospital pharmacist in health care system.
44. Give the role of hospital pharmacist in hospital organization.
45. Define community pharmacist in patient counseling and health care system.

## 4 MARKS QUESTIONS

46. Define hospital; give the functions of modern hospital.
47. Define hospital, classify it.
48. Describe organization of hospital.
49. Describe health delivery system In India.
50. Describe hospital management.
51. Define hospital pharmacy; give its objective and unction.
52. Describe location and layout of hospital pharmacy.
53. Give flow chart of material and me in hospital pharmacy.
54. Write short note on personnel and floor space requirements including equipments in hospital pharmacy.
55. Give the abilities required for hospital pharmacist.
56. Write in detail floor space requirements on basis of bed strength.
57. Give facilities required including equipments in hospital pharmacy.
58. Write short note on floor stock system
59. Write short note on centralized unit dose dispensing system.
60. Write short note on decentralized unit dose dispensing system.
61. Write short note on bed side pharmacy.
62. Write short note on satellite pharmacy.
63. Write short note on satellite pharmacy.
64. Give location of outpatient dispensing system.
65. Write short note on dispensing of controlled drug.
66. Write short note on individual prescription order system.
67. Write short note on ambulatory services.
68. Write factors which determine pack size for prepacking of drug in hospital pharmacy.
69. Write short note on dispensing of controlled drug.
70. Write short note on location and layout of outpatient dispensing.
71. Write short note on dispensing of ambulatory patients.
72. Write short note on central sterile supply departments.
73. Write short note on methods of sterilization.

74. Give the name of guide for drug information centre.
75. Write the name of databases for drug and chemical information.
76. Write short note on pharmacy and therapeutic committee.
77. Write short note on role of community pharmacist.
78. What is mobile dispensary unit?

## 2 MARKS QUESTIONS

79. Define hospital.
80. Define hospital pharmacy.
81. Define hospital formulary.
82. What is mean by central sterile supply department?
83. Give types of hospital
84. Give functions of hospital pharmacy.

BP IIIrd yr Vth SEM

PHARMACEUTICAL ENGINEERING-I

Questions carry 16 marks

1. Define size reduction, give its mechanism, mode of stresses applied in size reduction, classify size reduction equipments and explain Hammer mill.
2. Explain modes of stresses applied in size reduction. Describe Ball Mill and Hammer Mill.
3. Define size reduction, give its applications and explain modes of stresses applied in size reduction with mechanism. Classify size reduction equipments.
4. Classify size reduction equipments; explain crusher and cutting machine with examples.
5. Define size reduction; describe principle, construction and working of Ball Mill and Hammer Mill.
6. Describe principle, construction, working and uses of Fluid energy Mill and Rotary cutter Mill.
7. Classify size reduction equipments and describe principle, construction and working of Edge runner Mill and End runner Mill.
8. Describe principle, construction, working and uses of Rotary cutter Mill and Roller Mill.
9. Define size reduction and explain theory of size reduction.
10. Define size reduction, classify it, explain mode of stresses applied in size reduction and describe the factors affecting size reduction.
11. Define size separation, give the types of sieve and explain modes of motion in size separation.
12. Describe types of sieve an explain sieve shaker machine and Alpine airjet sieve.
13. Define size separation, explain modes of motion in size separation, describe shaking screen.
14. Define size separation, classify screening equipments.
15. Define separation, give the types of sieve. Describe Cyclone separator and Bag filter.
16. Classify size separation equipments; describe Rotex screen and Shaking screen.
17. Define mixing, explain mechanism of solid mixing, classify solid mixing devices, describe V-cone Blender.
18. Define mixing, explain factors influencing mixing and explain Sigma blade mixer.
19. Classify solid mixing equipments; describe Ribbon Blender and Planetary Mixer.
20. Define mixing, describe the mechanism of liquid-liquid mixing and describe mixing devices with flow pattern.
21. Define mixing, describe Barrel type continuous Mixer and Zigzag continuous Blender.
22. Explain mechanism of liquid mixing give the factors influencing liquid mixing in tanks. Describe jet mixing.
23. Explain jet mixer and airjet mixer.
24. Explain mixing vessels and mixing devices with flow pattern.

25. Define the term emulsifier, give the factors affecting the selection of an emulsifier, describe Silverstone emulsifier and ultrasonic emulsifier.
26. Classify mixing equipments for semi-solids, describe Triple Roller Mill.
27. Define conveying, give objective advantages of conveying, classify conveyer and describe belt conveyer.
28. Classify conveyers, explain Belt conveyer and screw conveyers.
29. Describe Pneumatic conveyer and bucket Conveyer
30. Describe principle, construction, working and uses of screw conveyer and chain conveyer.
31. Define centrifugation give its applications, explain theory of centrifugation.
32. Define centrifugation, classify centrifuge an describe principle, construction, working and uses of supercentrifuge.
33. Define centrifugation. Describe principle, construction, working and uses of semi-continuous centrifuge and continuous horizontal centrifuge.
34. Define centrifugation, classify centrifuges and explain perforated basket centrifuges.
35. Describe perforated basket type centrifuges and non-perforated basket centrifuges.
36. Describe super-centrifuge and De Laval Clarifier.
37. Classify centrifuges on the basis of scale of usage; describe super-centrifuge and conical disc centrifuge.
38. Define filtration, describe process of filtration, give its applications and explain mechanism of filtration & give its types.
39. Explain mechanism of filtration give the types of filters and describe theory of filtration.
40. Define filtration, give the factors influencing filtration and explain theory of filtration.
41. Define filtration, describe filter medias and filter aids, classify filtration equipments. Describe drum filters.
42. Define filtration, classify filtration equipments. Describe plate and frame filter press.
43. Explain leaf filter and metafilter.
44. Describe cartridge filter and drum filter.
45. Define fluid dynamics; describe Reynolds experiment and Bernoulli’s theorem.
46. Classify flow of fluids measuring device. Describe orifice meter and derive equation for velocity at a point of orifice meter.
47. Describe orifice meter and venturi meter.
48. Classify pumps and describe piston pump with examples.
49. Describe principle, construction and working of simplex, double acting, steam driven, deck valve, piston pump and duplex outside-end packed, power driven, pot valves and plunger pump.

Questions carry 8 marks

50. Define size reduction. Give advantages and disadvantages of size reduction and explain mechanism of size reduction.

51. Define size reduction, explain mechanism of size reduction and modes of stresses applied in size reduction.
52. Classify size reduction equipment and explain principle, construction, working and uses of Ball Mill.
53. Write principle, construction, working of Rotary Cutter Mill and Roller Mill.
54. Describe Edge Runner Mill and End Runner Mill.
55. Classify size reduction equipments and explain principle, construction, working and uses of Hammer Mill.
56. Write principle, construction, working, uses, advantages and disadvantages of fluid energy mill.
57. Define size reduction. Classify size reduction equipments. Describe colloidal mill.
58. Explain the factors affecting size reduction.
59. Describe theory of size reduction along with different laws.
60. Define size reduction. Give the official standards for powder. Explain the types of sieve.
61. Define size separation. Explain modes of motion in size separation.
62. Describe sieve shaker machine and Alpine airjet sieve.
63. Classify equipment for size reduction describe shaking screen and Rotex screen.
64. Describe principle, construction, working and uses of bag filter.
65. Describe Cyclone separator and air separator.
66. Define size separation. Classify size separation equipments and describe rotex screen.
67. Define size separation. Give official standards for powder and describe modes of motion in size separation.
68. Define give application of solid mixing. Explain the mechanism of mixing.
69. Define mixing. Describe the factors influencing mixing and classify solid mixing equipments.
70. Write principle, construction, working and uses of tumbler and V-cone blender.
71. Explain double cone blender and tumbling blender with agitator mixing blade.
72. Give the mechanism of solid mixing and explain in detail ribbon blender.
73. Define solid mixing. Give solid mixing mechanism an describe sigma blade mixer.
74. Explain mechanism of solid mixing. Explain planetary mixer.
75. Describe barrel type continuous mixer and Zigzag continuous mixer.
76. Explain mechanism of liquid mixing and add note on mixing vessels.
77. Describe mixing devices and flow pattern.
78. Give mechanism of liquid mixing and give the factors influencing liquid mixing.
79. Write principle, construction and working of jet mixer and airjet mixer.
80. Explain mechanism of liquid mixing. Write note on mixing vessel and explain pipe mixer.
81. Give the factors influencing selection of an emulsifier describe Silverson emulsifier.
82. Explain principle, construction, working and uses of ultrasonic emulsifier.
83. Give examples of agitator mixer and shear mixer. Describe triple roller mill
84. Define centrifugation. Describe thory of centrifugation.
85. Define centrifugation. Classify centrifuges, give applications of centrifugation.

86. Describe principle, construction, working of perforated basket centrifuge and non-perforated basket centrifuge.
87. Define centrifugation. Classify centrifuges and describe short-cycle automatic batch centrifuge.
88. Write principle, construction, working and uses of supercentrifuge.
89. Describe principle, construction, working, advantages, dis-advantages and uses of disc centrifuge.
90. Classify centrifuges. Describe in detail continuous horizontal centrifuge.
91. Define conveying. Explain principle, construction, working and uses of Belt Conveyer.
92. Define conveying. Explain principle, construction, working and uses of Pneumatic Conveyer.
93. Define conveying. Explain principle, construction, working and uses of Chain Conveyer.
94. Define conveying. Explain principle, construction, working and uses of Bucket Conveyer.
95. Define conveying. Give its objective and advantages. Classify it.
96. Define filtration. Give its applications and give the types of filtration.
97. Explain the mechanism of filtration along with the types of filtration.
98. Define filtration. Give its applications and differentiate surface filtration and depth filtration.
99. Give types of filtration and explain theory of filtration.
100. Describe theory of filtration along with the factors influencing filtration.
101. Write a note on filter media and filter aid.
102. Write principle, construction, working and uses of plate and frame filter press.
103. Classify filtration equipment. Describe filter leaf.
104. Define filtration. Describe drum filter.
105. Give types of filtration and describe meta-filter.
106. Define flow of fluids and describe the types pressure measuring devices.
107. Describe Bernoulli’s theorem.
108. Define fluid dynamics. Write in brief Reynolds experiment.
109. Classify flow measuring devices and explain venturi meter.
110. Explain orifice meter.
111. Describe Pitote tube.
112. Explain Rotameter and direct displacement method.
113. Give the types of valve, explain it.
114. Classify pump. Describe principle, construction, working and uses of simplex, double acting, steam driven, deck valve, piston pump.
115. Write duplex, outside-end packed, power driven, pot valve, plunger pump.
116. Describe diaphragm pump.
117. Describe single stage, single suction, open impellar volute pump.
118. Write note on rotary pump.

Questions carry 4 marks

119. Define size reduction; give advantages and disadvantages of size reduction.
120. Explain mechanism of size reduction with modes of stresses applied in size reduction.
121. Define size reduction give its mechanism and classify size reduction equipments.
122. Write principle, construction, working and uses o rotary cutter mill.
123. Describe roller mill.
124. Describe edge runner mill
125. Describe end runner mill
126. Describe theory of size reduction.
127. Describe four factors which influence the selection of milling equipments for size reduction
128. Describe mechanism of size reduction with suitable example.
129. What are ultra fine grinders? Explain concept of ultrafine grinding?
130. Describe micronizer ,describe aseptic grinding process of antibiotics.
131. Enlist the laws governing size reduction.
132. How's energy utilization in size reduction accounted for?
133. Give official standards for powder.
134. Write short note on types of sieves.
135. Describe modes of motion in size separation.
136. Describe sieve shaker machine.
137. Describe alpine airjet sieve.
138. Write principle, construction, working and uses of shaking screen.
139. Write principle, construction, working and uses of rotex screen.
140. Write principle, construction, working and uses of cyclone separator.
141. Write principle, construction, working and uses of air separator.
142. Write principle, construction, working and uses of bag filter
143. Define solid mixing, explain mechanism of solid mixing.
144. Give the factors influencing solid mixing
145. Classify solid mixing devices with example
146. Write principle, construction, working and uses of tumblers.
147. Write principle, construction, working and uses of twin shell blenders
148. Write principle, construction, working and uses of double cone blender
149. Write principle, construction, working and uses of tumbling blender with agitator mixing blade
150. Write principle, construction, working and uses of ribbon blender.
151. Write principle, construction, working and uses of sigma blender.
152. Write principle, construction, working and uses of planetary mixer.
153. Write principle, construction, working and uses of barrel type of continuous mixer
154. Write principle, construction, working and uses of zigzag continuous mixer
155. Explain mechanism of liquid-liquid mixing.
156. Write short not on mixing vessel.
157. Write short not on mixing devices.

158. Write short not on flow pattern during mixing.
159. Give factors influencing mixing in liquid tanks.
160. Write principle, construction, working and uses of airjet mixer.
161. Write principle, construction, working and uses of jet mixer.
162. Write principle, construction, working and uses of flow mixer.
163. Describe Silverson emulsifier.
164. Describe Rapisonic homogenizer.
165. Write principle, construction, working and uses of triple roller mill.
166. Define centrifugation give its applications.
167. Explain theory of centrifugation.
168. Classify centrifuges.
169. Describe perforated basket centrifuge.
170. Describe non-perforated basket centrifuge.
171. Describe conical disc centrifuge.
172. Write principle, construction, working and uses of pneumatic conveyor with labeled diagram.
173. List advantages of screw conveyor and screw elevator how you compare these with pneumatic transport of solid.
174. Describe principle, construction, working and uses of screw conveyor.
175. Define filtration give its application.
176. Explain mechanism of filtration and give the types of filtration.
177. Explain theory of filtration.
178. Enlist and explain factors influencing filtration.
179. Write short note on filter aid and filter media.
180. Describe principle, construction, working and uses of filter leaf.
181. Describe principle, construction, working and uses of metafilter.
182. Describe principle, construction, working and uses of drum filter.
183. Describe principle, construction, working and uses of disc filter.
184. Write short note on fluid static.
185. Write short note on fluid dynamic.
186. Describe simple manometer.
187. Describe differential manometer.
188. Describe Reynolds theory.
189. Short note on Bernoulli’s theorem.
190. Describe venture meter.
191. Describe orifice meter.
192. Describe venture meter.
193. Describe rotameter meter.
194. Describe Pitot tube.
195. Write short note on valves.
196. Write short note on pumps.
197. Classify pumps, write note on rotary pump.
198. Compare characteristics of reciprocating pump and centrifugal pump.

Questions carry 2 marks

199. It is essential to include a sieve in the size reduction equipment. Why?
200. Differentiate the mechanism, attrition and impact in size reduction.
201. Define size reduction; enlist advantages and disadvantages of size reduction.
202. Classify size reduction equipments.
203. Draw diagram of ball mill.
204. Define size separation, enlist types of sieves.
205. Name the standard of sieves used in pharmaceutical practice.
206. What are standard sieves.
207. Mention the equipments used for solid-solid mixing.
208. Define and differentiate mixing and agitation.
209. Classify liquids based on their miscibility. Give one example on each case.
210. Suggest suitable mixing equipments for semisolid.
211. Describe the different factors influencing the selection of an emulsifier.
212. List the factors influencing the rate of filtration.
213. Write kozeny-carman equation and give its significance.
214. List the influence of filter aid.
215. List the properties of filter aid.
216. Distinguish filtration and clarification.
217. What are filter aids? Give two examples.
218. Write two pharmaceutical application of centrifugal sedimentation.
219. What are basket centrifuge. Describe their application.
220. Explain the principle behind centrifugal separation.

## PHARMACEUTICAL ORGANIC CHEMISTRY III

**Question carries 4 marks**

1. Classify carbohydrate with examples.
2. What is mutarotation in carbohydrates give its significance.
3. What are reducing and non reducing sugars?
4. Give the projection formulas for glucose and fructose.
5. What is conformation? Draw the conformations of glucose.
6. Draw Haworth projection for glucose and fructose.
7. Write note on mutarotation.
8. Give the Haworth structures of maltose and sucrose.
9. Write short not on polysaccharides.
10. What are amino acids? Classify it with structures.
11. Why amino acids are dipolar ions?
12. Write about isoelectric point of amine acids.
13. Give the general principles of polypeptide synthesis.
14. Define amino acids and classify it.
15. What are proteins and classify it?
16. Write a note on rancidity of oils.
17. What are lipids? Give the biological functions of lipids.
18. What are lipids? Classify it with examples.
19. Write in short about waxes.
20. Write a note on sphingolipids.
21. Give the difference between fats and oils.
22. Define acid value, saponification, iodine and reichert-meissl value.
23. What happens when fats are hydrolyzed?
24. What are waxes? Give examples of common waxes.
25. Define heterocyclics giving suitable structures of acridine and Purine.
26. Draw and explain molecular orbital picture of pyrrole.
27. Give the structure of pyrimidine, indole, Purine, Phenothiazine.
28. Why pyridine is more basic than pyrrole.
29. Give the molecular orbital picture of pyridine and pyrrole.
30. Pyridine is more basic than pyrrole but less basic than aliphatic amines. Justify.
31. Why pyridine requires vigorous reaction condition than pyrrole to undergo electrophilic aromatic substitution.
32. Write a comparative note on aromatic character of pyrrole and furan.
33. Draw the structure of Acridine and Purine.
34. Why electrophilic substitution in pyrrole takes place at 2- position.
35. Draw the structures of isoxazole, imidazole, pyrimidine, quinoxaline.
36. Draw the structures of thiazole, Benzimidazole, Acridine, oxazole.
37. Write about orbital picture and resonance structure of furan.

**Question carries 8 marks**

38. Discuss in detail the Fischer proof of D(+) glucose.
39. Classify carbohydrates with suitable examples. Explain in brief killiani-fischer synthesis of carbohydrate.
40. Discuss the structure of D- glucose.
41. Describe in detail the Killiani-Fischer synthesis and ruff degradation for conversion of aldopentose to its derivative.
42. What are carbohydrates explain in detail the cyclic structures of glucose and fructose.
43. What is mutarotation? Explain the various mechanisms to explain mutarotation.
44. Explain in detail about each method of ascending and descending the sugar series.
45. Explain the action of monosaccharide (glucose) with:
    a. Bromine water b. nitric acid c. periodic acid d. Benedict reagent, Fehling and Tollen's reagent.
46. Define configuration. Explain in detail about configuration of D(+) glucose.
47. Explain the reactions of monosaccharides.
48. Explain in detail about the conformations of monosaccharides.
49. What are amino acids? Give their classification in detail.
50. Define amino acid. Give the synthetic methods of amino acids.
51. Discuss C-terminal residue analysis of peptide.
52. Give in detail about general synthetic methods from the preparation of amino acids.
53. Give the C-terminal and N-terminal residue analysis of peptides.
54. Explain in detail the isolation and separation of amino acids.
55. Explain in detail principles and synthetic methods of polypeptides.
56. What are amino acids? Classify them with suitable examples. Outline the synthesis of amino acids.
57. Discuss the various chemical constants used for the evaluation of oils.
58. Explain in brief about phospholipids.
59. Classify lipids. Write in brief about phospholipids.
60. Explain in detail about chemical properties of fats.
61. Explain in detail analysis of oils and fats.
62. What are lipids? Give in detail about compound lipids.
63. Explain nucleophilic substitution reaction of pyridine.
64. Give detail account on synthetic method and ring closure method of pyrrole.
65. Draw the orbital picture of pyrrole and explain in detail electrophilic substitution reaction in pyrrole.
66. Give the method of preparation of furan and draw its resonance structure.
67. Explain the orbital picture and synthetic methods of furan.
68. Why pyridine requires vigorous condition than pyrrole to undergo electrophilic aromatic substitution? Explain nucleophilic substitution reaction in pyridine.
69. Give a detail account on electrophilic substitution reaction in indole.
70. Discuss the structure of naphthalene in brief along with the reaction.
71. Give the reaction mechanism for anthracene and phenanthrene.
72. Explain in detail substitution products of naphthalene

**Question carries 16 marks**

73. What are carbohydrates? Classify it with structures. Explain in detail reactions of monosaccharide.
74. Write in detail about the following.
    a. Mutarotation.
    b. Configuration of aldoses.
75. Explain reactions involved in shortening and lengthening of carbon chain with respect to (-) Arabinose.
76. What are amino acids? Write a note on isoelectric point. Explain in detail synthetic methods of amino acids.
77. Explain in detail about primary, secondary, tertiary and quaternary structures of protein.
78. What are lipids? Classify lipids giving suitable examples. Explain in detail the chemical properties of lipids.
79. Write in detail about following.
    a. Phospholipids
    b. Glycolipids
    c. Shingolipids.
80. What are polypeptides? Discuss C-terminal and N-terminal residue analysis of peptides.
81. What are peptides and polypeptides? Discuss about general principles and methods of synthesis of polypeptides.
82. Write the synthesis and electrophilic aromatic substitution reaction of pyrrole.
83. Write the synthesis and electrophilic aromatic substitution reaction of isoquinoline.
84. Write the synthesis and electrophilic aromatic substitution reaction of Quinoline.
85. Write about orbital picture of pyridine. Explain in detail about nucleophilic substitution reaction of pyridine. Explain why, pyridine requires vigerous condition to undergo electrophilic reaction?
86. Write short note on any two
    a. Fisher-indole synthesis.
    b. Skraup synthesis of Quinoline.
    c. Knorr synthesis of pyrrole.
    d. Chichibabin reaction.
87. Give any four of the following synthesis with its reaction mechanism.
    a. Fischer indole synthesis.
    b. Skraup synthesis of Quinoline.
    c. Bischler-napieralski synthesis of isoquinoline.
    d. Knorr synthesis of pyrrole.
    e. Chichibabin reaction.

# PHARMACOLOGY-III

4 Mark questions

1) Write a note on Disulfiram
2) Give clinical uses of Ethanol.
3) Give ideal properties of anaesthetics.
4) Give the mechanism of action of general anaesthetics.
5) Write a note on Preanaesthetic medication.
6) Write a note on anti-convulsant.
7) Write a note on Anti-psychotic drugs.
8) Write a short note on selective serotonin reuptake inhibitors ( SSRIs)
9) Write a short note on anti-anxiety drugs.
10) Why is pentazocine contraindicated in acute myocardial infraction.
11) Classify anti-asthmatic drugs.
12) Give treatment of asthma.
13) Write advantages and disadvantages of clinical trials.
14) What is sedative? Give two examples.
15) What is the rational use of sodium bicarbonate in barbiturate poisoning.
16) Why benzodiepines are preffered over barbiturates as sedative and hypnotics.
17) What is the rational for use of atropine as preanaesthetic medication.
18) Explain rational for the combine use of halothane and nitrous oxide.
19) Why thiopentone has brief duration of action explain?
20) Write a note on anti-diarrhoeal agent.
21) List two mucolytic drugs and give their mechanism of action.
22) Write a note on mast cell stabilizers.
23) Write a note on $\beta_2$- adrenergic agonists.

6 Mark questions

1) Comment on management of alcohol intoxication and disulfiram.
2) Write a note on methyl alcohol.
3) Write a note on preanaesthetic medication.
4) Classification of Epileptics seizures.
5) Write a short note on neurodegenerative disorder.
6) Mention the difference between morphine and pethidine.
7) Explain the rational use of methadone in the treatment of opioids dependence.
8) Explain the method used to prolong the action of local anaesthetics.
9) Short note on selective β2-adrenergic agonists.
10) Write a note on Laxative and purgative.
11) Write a note on anti-emetics.
12) Write in detail about management of clinical trial.
13) Enumerate intravenous general anaesthetics and explain the merits and demerits of ketamine.
14) Define emetics and anti-emetics and write mechanism of vomiting.
15) Write a short note on management on diarrhoea.
16) Write a short note on oral dehydration solution.

17) Write in detail about Alcoholism.
18) Write objective of General Anaesthesia.
19) Write mechanism of General Anaesthesia.
20) Write a note on nitrous oxide.
21) Write a note on Valproate sodium.
22) Drug therapy of status epileptics.
23) Write in detail type of pain.
24) Write a note on acute opioids poisoing.
25) Write a note on Naltrexone.
26) Classification of CNS stimulants.
27) Type and ideal properties of antacids.
28) Classification of drug uses in peptic ulcer.
29) Describe drug that inhibit gastric acid secreation.
30) Write a note on Sodium bicarbonate.
31) Define Antipsychosis and nature of psychosis.

8 Marks questions

1) Write a note on cell signaling.
2) Write a note on neurotransmitters.
3) Write a note on central neurotransmitters.
4) Give a pharmacological account of ethanol.
5) Define neurohumoral transmission? Explain the steps involved in neurohumoral transmission.
6) Give the stages of general anaesthesia. Write a note on preanaesthetic indication.
7) Classify drug used in general anaesthetics and write a note on Inhalation anaesthesia and Intravenous anaesthetics.
8) Describe sleep pattern and classification of sedative and hypnotic.
9) Write uses and techniques of local anaesthesia.
10) State mechanism of action, pharmacokinetics, therapeutic uses and adverse effect of tricyclic antidepressants.
11) What are antidepressants, give mechanism of action and unwanted effect of tricyclic antidepressants.
12) Classify Anti-anxiety drugs and treatment of Anxiety drugs.
13) Write a note on drug dependence and drug abuse.
14) Write a note on CNS Stimulants.
15) Classify CNS Stimulants and a note on Amphetamines.
16) Write a short note on caffeine and give its pharmacokinetic effects and uses.
17) Write a note on Codeine and Pethidine.
18) Explain the therapeutic uses and contraindication of morphine.
19) Enumerate Local anaesthetics. Explain the techniques of local anaesthetics with one clinical uses of each.
20) Explain the mechanism of action and adverse effect of lignocaine.
21) Write briefly on i) spinal anaesthesia and ii) surface anaesthesia.
22) Write a note on Demulcents and Expectorants.
23) Classify purgative and explain the mechanism of action of osmotic purgative.
24) List three classes of anti-emetics with examples and explain mechanism of action.
25) Explain phases of clinical trials.

26) Explain ethical issues in clinical trials.
27) Write briefly on i) Diazepam ii) Flumazenil
28) Classify General anaesthesia and explain the objectives of pre-anaesthetic medication.
29) Write briefly on (any two) i) Thiopentone sodium ii) Ketamine iii) Halothane
30) Write a short note on ( any two) i) Isoflurane ii) Desflurane iii) Enfluran
31) Write a note on ( any two) i) Lidocaine ii) Tetracaine iii) Bupivacaine
32) Write a note on Salbutamol and theophylline.
33) Write a short note on (any two) i) Acetazolamide ii) Primidone iii)Phenacimide
34) Write in detail about neurophysiology of pain.
35) Write a short note on ( any two) i) Hydromorphone ii) oxymorphone iii) Heroin
36) Write a short note on ( any two) i) Methadone ii) Propoxyphene iii) Phenylpiperidines
37) Write in detail about pentazocine and Narcotic antagonists.
38) Write in detail about Noscapine and Dextromethorphane.
39) Write a short note on Drug dependence and Habituation.
40) Define anti-depression and classification of depression.

10 marks questions

1) Define anti-convulsants, describe in detail mechanism of action and write in brief the various antiepileptics agents.
2) Classify anti-epileptics agents. Give mechanism of action and adverse effects of phenytoin.
3) Explain the therapeutically useful action of opioids analgesics, and outline the management of morphine poisoning.
4) Classification of anti-emetic drugs. Give a brief account on Dextromethorphan.
5) Explain the pharmacological basis for the following ( any two)
   i) Ranitidine is preferred to Cimetidine in peptic ulcer.
   ii) Use of misoprostol for peptic ulcer induced by NSAIDS.
   iii) Ondansetron in cancer chemotherapy- induced vomiting.
6) Explain the following drug interation:-
   i) Ranitidine and sucralfate
   ii) Metoclopramide and L-Dopa
7) Write various phases of clinical research and add a note on clinical trials in drug development
8) Write a brief account on i) Mast cell stabilizers ii) Selective $\beta_2$- adrenergic agonist

16 marks questions

1) Give the mechanism of action, pharmacological action, pharmacokinetics, contraindication and toxicity of Ethanol.
2) Define Sedative and hypnotic. Give the pharmacological action, mechanism of action adverse effect and contraindication of barbiturates.
3) Give pharmacological action, mechanism of action,adverse effect and therapeutic uses of benzodiezepam.
4) Define and classify seizures. Give the classification of anticounvulsants. Discuss in detail pharmacology of each class of anticounvulsants.

5) Classify antipsychotic drugs. Give its pharmacological action,pharmacokinetics, adverse effect and uses of chlorpromazine.
6) Classify opioids analgesics. Describe mechanism of action, pharmacological action, pharmacokinetics, adverse effect and contraindication of morphine.
7) Classify the drugs used in the treatment of Bronchial asthma. Explain the mechanism of action of different group in this condition.
8) Explain the mechanism of action, pharmacological action, pharmacokinetics, adverse effect and uses of Methyl xanthines.
9) Classify the drugs used in peptic ulcer. Explain the mechanism of action and therapeutic uses of proton pump inhibitors.
10) Define and classify anti-emetics. Give mechanism of action, pharmacological action and adverse effect of Hyoscine.
11) What is clinical trial? Describe phases of clinical trial. Explain clinical trial in new drug development. Comment on various document required in clinical study.
12) Write short note on (any four) i) Diazepam ii) Nitrazepam iii) Alprazolam iv) Zopiclone v) Flumazenil.
13) Write a short note on (any four) i) Phenobarbitone ii) Phenytoin iii) Succinimides iv) Lidocaine v) Lomotrigine.
14) Write a short note on ( any four ) i) Opioids antagonists ii) Buprenorphine iii) Naloxane iv) Methadone v) Tramadole vi) Pentazocine
15) Write short note on i) Codiene ii) Anti-tussives iii) Expectorants iv) Cough suppressants Bromhexine.
16) Write a short note on (any two) i) Psychologic dependence ii) physical dependence iii) Addiction iv) Drug misuse v) Drug abuse
17) Write a detail account on phenothiazine.
18) Write a detail account on monoamino oxidase inhibitors (MAOIs)

**PHARMACOGNOSY-III**

| | | |
|---|---|---|
| **1. Extraction, Isolation and Purification methods for phytopharmaceutical.** | | |
| 1 | Explain the role of mass theory in extraction process. | 06 |
| 2 | Write a short note on Mass Transfer Theory. | 08 |
| 3 | Justify the role of Mass Transfer Theory in extraction process. | 08 |
| 4 | Draw a well labelled diagram of hot percolation and explain it. | 08 |
| 5 | Write a short note on maceration process. | 08 |
| 6 | Explain the role of extraction in phytopharmaceutical. | 08 |
| 7 | Enlist and explain the factors affecting Mass Transfer Theory. | 06 |
| 8 | Justify the role of chromatography in plant study. | 06 |
| 9 | Give the application of chromatography in herbal study. | 06 |
| 10 | Elaborate the term Paper chromatography. | 08 |
| 11 | Define the term extraction and isolation. Enlist certain extraction process used to remove phytopharmaceutical products from natural sources. | 16 |
| 12 | Explain the role of TLC with its detail study. | 08 |
| 13 | Enlist different methods of extraction, isolation and purification of phytoconstituent. Explain high performance liquid chromatography | 10 |
| 14 | Write a note on Soxhlet extraction with well labelled diagram. | 05 |
| 15 | What do you mean by chromatography? Explain thin layer chromatography. | 08 |
| 16 | What is extraction? Explain supercritical fluid extraction. | 06 |
| 17 | Explain in brief about Column chromatography well labelled diagram. | 06 |
| 18 | What do you mean by chromatography? Enlist different types of chromatography that are used for isolation and purification of phyto-constituents. Explain HPLC with examples. | 10 |
| 19 | Enlist different methods of extraction of phytoconstituent from a crude drug. Add a note on Soxhlet extraction. | 06 |
| 20 | What is extraction? Classify different methods of extraction. Write an account on Supercritical fluid extraction. | 10 |
| 21 | Explain thin layer chromatography. | 06 |
| 22 | Give the principle and application of size exclusion chromatography. | 08 |
| 23 | Explain paper chromatography. | 06 |
| 24 | Give detail account HPLC and GLC. | 10 |
| 25 | Explain principle and application of adsorption chromatography. | 06 |
| 26 | Write a short note on Maceration and percolation. | 04 |
| 27 | Write a short note on Affinity chromatography | 04 |
| 28 | Write a short note on Theory of mass transfer. | 04 |
| 29 | Explain the role of extraction and isolation in phytopharmaceutical products. | 08 |
| 30 | Give the general principal of TLC and PC. | 06 |
| **2. Lipids, Enzymes and Proteins.** | | |
| **Lipids** | | |
| 31 | What are Lipids? Classify them and discuss analytical parameters of lipids. | 14 |
| 32 | Define Lipids. Discuss classification and properties of Lipids. Give synonym, biological source, chemical constituent, uses and method of preparation of cod liver oil and castor oil. | 16 |
| 33 | Differentiate between fixed oils, fats and waxes. Give the biological sources, chemical constituents and uses of cocoa butter and bees wax. | 08 |
| 34 | Write synonym, biological source, chemical constituent, uses and method of preparation of<br>a) Castor oil b) cocoa butter c) Gelatin d) Cod liver oil | 12 |

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| 35 | Give pharmacognostic account on castor oil. | 05 |
| 36 | Define and classify protein. | 08 |
| 37 | Explain in detail the source, family, cultivation, collection, standard parameter, chemical constituents, chemical tests, uses, substitutes, adulterants and storage of Peanut oil. | 16 |
| 38 | | |
| 39 | Explain in detail the source, family, cultivation, collection, standard parameter, chemical constituents, chemical tests, uses, substitutes, adulterants and storage of Castor oil. | 16 |
| 40 | Explain in detail the source, family, cultivation, collection, standard parameter, chemical constituents, chemical tests, uses, substitutes, adulterants and storage of Sesame oil. | 16 |
| 41 | Give biological source, chemical constituent along with method of preparation of Castor oil. | 10 |
| 42 | Give biological source, chemical constituent along with method of preparation of Cod liver oil. | 10 |
| 43 | Give biological source, chemical constituent along with method of preparation of Shark liver oil. | 10 |
| 44 | Give biological source, chemical constituent along with method of preparation of Bees wax. | 10 |
| 45 | Write a short note on method of analysis of Lipid. | 08 |
| 46 | Define the term extraction. Elaborate the method of extraction of lipid. | 12 |
| 47 | Biosynthetic pathway of lipid. | 12 |
| 48 | Explain the term lipid and write in short about its chemistry. | 10 |
| 49 | Classify and expain the method of analysis of lipid. | 08 |
| 50 | Give the chemical test of Lipid class. | 06 |
| **Enzymes** | | |
| 51 | What do you mean by the term Enzyme? Explain properties of it. | 12 |
| 52 | Define enzyme. Briefly explain the classification of it with general properties. | 12 |
| 53 | Briefly explain diastase with reference to their methods of preparation, properties, uses and identification test. | 12 |
| 54 | Give biological source, properties, identification test, uses along with method of preparation of Papain enzyme. | 12 |
| 55 | Give biological source, properties, identification test, uses along with method of preparation of pepsin enzyme. | 10 |
| 56 | Briefly explain Pancreatin with reference to their method of preparation, properties, uses and identification test. | 05 |
| 57 | Justify full description of Trypsin. | 10 |
| 58 | Discuss method of preparation of Papain / Diastase / Pepsin / Pancreatin.(any one) | 08 |
| 59 | Define and discuss various types of enzyme. Write a note on its mechanism of action. | 12 |
| 60 | Give the method of preparation of Bromelain. | 08 |
| 61 | Give the method of preparation of Papain. | 08 |
| 62 | How will you isolate Bromelain from pineapple stem? | 08 |
| **Protein** | | |
| 63 | Describe briefly about protein. | 12 |
| 64 | Define and classify the term Protein. | 10 |
| 65 | Write a short note on Gelatin. | 08 |
| **3. Terpenoids and Volatile oils** | | |
| 66 | Define volatile oil. Enlist and discuss any two general method of extraction and isolation of volatile oil. | 10 |
| 67 | Define volatile oil and classify it with suitable examples. | 06 |
| 68 | Differentiate between volatile oil and fixed oil. | 04 |

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| 69 | What do you understand by chemical test of volatile oil? Discuss general properties of it. | 05 |
| 70 | Discuss biological source, active constituent, microscopic characters, chemical test, and therapeutic uses of Foniculum vulgare with well labelled diagram. | 10 |
| 71 | Give pharmacognostic account of cinnamon bark. | 10 |
| 72 | Write a note on adulterant and chemical test of clove bud. | 06 |
| 73 | Write a note on adulterant of cardamom fruit. | 04 |
| 74 | Give pharmacognostical account of lemon grass oil with special emphasis on isolation method. | 14 |
| 75 | Differentiate between dill and fennel. | 06 |
| 76 | Define and classify volatile oil. Discuss any one drug belonging alcohol volatile oil category. | 14 |
| 77 | Define and classify volatile oil. Discuss any one drug belonging aldehyde volatile oil category. | 14 |
| 78 | Elaborate and explain biosynthesis pathway of terpenoid. | 10 |
| 79 | What is essential oil? Explain biosynthetic pathway and general methods of isolation of volatile oils from plants. | 16 |
| 80 | Classify volatile oils with suitable examples. Write chemistry and biosynthetic pathways of terpenoids. | 10 |
| 81 | Give pharmacognostic account of cinnamon bark. | 10 |
| 82 | What is essential oil? How are they biosynthesis in plants? Give the general methods of isolation and classification of essential oils. | 16 |
| 83 | What are essential oils? Write classification, general method of isolation and analysis of volatile oils. Write pharmacognostic account on fennel. | 16 |
| 84 | Describe in detail introduction, isolation, identification and the therapeutic effects of volatile oil. | 16 |
| 85 | Short note on Tulsi and Lemon grass oil. | 08 |
| 86 | Define the term volatile oil, terpene and terpenoid. | 06 |
| 87 | Write a short note on the occurrence and distribution of volatile oil. | 06 |
| 88 | Write a short note on the properties of volatile oil. | 04 |
| 89 | Define volatile oil and classify it with example. | 08 |
| 90 | Write a short note on the chemistry of volatile oil. | 06 |
| 91 | Give the classification of volatile oil with its occurrence in nature. | 08 |
| 92 | Write general properties of volatile oil along with its uses. | 06 |
| 93 | Give a short note on the extraction and isolation of volatile oil. | 16 |
| 94 | Give the different extraction methods of volatile oil. | 08 |
| 95 | What are essential oils? Give the method of extraction and evaluation of it. | 12 |
| 96 | Write a short note on the biosynthetic pathway of terpenoid. | 12 |
| 97 | Define the term volatile oil and give its biosynthetic pathway. | 12 |
| 98 | Elaborate the biosynthesis pathway of terpenoid. | 12 |
| 99 | Write a short note on chemical and physical properties of terpenoid. | 06 |
| 100 | Define the term volatile oil and write a pharmacognostic account of any one crude drug belongs to hydrocarbon category. | 16 |
| 101 | Define the term volatile oil and write a pharmacognostic account of any one crude drug belongs to alcohol category. | 16 |
| 102 | Define the term volatile oil and write a pharmacognostic account of any one crude drug belongs to aldehyde category. | 16 |
| 103 | Define the term volatile oil and write a pharmacognostic account of any one crude drug belongs to ketone category. | 16 |
| 104 | Define the term volatile oil and write a pharmacognostic account of any one crude drug | 16 |

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| | belongs to phenol category. | |
| 105 | Define the term volatile oil and write a pharmacognostic account of any one crude drug belongs to phenolic ether category. | 16 |
| 105 | Define the term volatile oil and write a pharmacognostic account of any one crude drug belongs to oxide category. | 16 |
| 107 | Draw a well labelled diagram of coriander with its source and chemical constituents. | 10 |
| 108 | Draw a well labelled diagram of cardamom with its source and chemical constituents. | 10 |
| 109 | Draw a well labelled diagram of cinnamon bark with its source and chemical constituents. | 10 |
| 110 | Draw a well labelled diagram of dill fruit with its source and chemical constituents. | 10 |
| 111 | Draw a well labelled diagram of fennel fruit with its source and chemical constituents. | 10 |
| 112 | Draw a well labelled diagram of clove bud with its source and chemical constituents. | 10 |
| 113 | Draw a well labelled diagram of neelgiri leaf with its source and chemical constituents. | 10 |
| 114 | Write a source, constituent, uses of any one drug of Graminae family. | 06 |
| 115 | Chemical test of volatile oil. | 04 |
| 116 | Write source, constituent, uses and adulteration of<br>a) Cardamom fruit<br>b) Cinnamon bark<br>c) Eucalyptus leaf<br>d) Clove buds. | 08 |
| 117 | Write a short note on the adulteration of cardamom fruit. | 06 |
| 118 | Write a short note on the adulteration of clove bud. | 06 |
| 119 | Write a short note on the adulteration of cinnamon bark. | 06 |
| 120 | Discuss the Pharmacognosy of any one drug belonging to alcoholic category of volatile oil. | 12 |
| 121 | Discuss the Pharmacognosy of any one drug belonging to Aldehyde category of volatile oil. | 12 |
| 122 | Discuss the Pharmacognosy of any one drug belonging to ketone category of volatile oil. | 12 |
| 123 | Discuss the Pharmacognosy of any one drug belonging to phenol category of volatile oil. | 12 |
| 124 | Discuss the Pharmacognosy of any one drug belonging to phenolic ether category of volatile oil. | 12 |
| 125 | Discuss the Pharmacognosy of any one drug belonging to oxide category of volatile oil. | 12 |
| 126 | Elaborate general biosynthetic pathway of terpenoid along with biogenesis process. | 12 |
| 127 | Classify the term volatile oil and give its chemistry. | 08 |
| 128 | Elaborate the extraction and isolation method of volatile oil. | 12 |
| 129 | Explain in detail about distillation process with well labelled diagram. | 10 |
| 130 | Short note on chemical test of volatile oil and isoprene uint. | 06 |
| **4. Biogenesis of natural products.** | | |
| 131 | Give brief introduction to biosynthesis with an account of primary and secondary metabolites production from carbon metabolism. | 12 |
| 132 | Give an account on production of amino acid by shikimic acid pathway. | 10 |
| **5. Introduction to Natural colour and dye** | | |
| 133 | Define, classify and note down the chemistry of natural colour with special emphasis on natural examples. | 12 |
| 134 | Write a short note on natural colour dye. | 10 |
| 135 | Give Sym, BS, CC and uses of Heena. | 04 |
| 136 | Short note on chemistry of natural colour. | 08 |
| 137 | Give Sym, BS, CC and uses of Saffron. | 06 |
| 138 | Give classification of natural colour with Pharmacognosy of Heena. | 08 |
| 139 | Write a short note on the chemistry of natural colour. | 08 |
| 140 | Define and classify the term natural colour and dye. | 08 |
| **6. Plant bitter and plant sweeteners.** | | |

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| 141 | Discuss nutritive sweeteners with examples. | 08 |
| 142 | Write an exhaustive note on Natural sweeteners. | 04 |
| 143 | What are sweeteners? Give their classification; add a note on glycyrrhizin as a non-nutritive sweetner. | 08 |
| 144 | Define and classify plant sweeteners with suitable examples. | 08 |
| 145 | Write a short note on Plant bitters. | 04 |
| 146 | Define and give biological source of any three plant bitter drug. | 08 |
| 147 | Briefly explain plant bitter with their pharmacological action. | 10 |
| 148 | Write a short note on bitter tonic drug. | 08 |
| 149 | Write a short note on non-nutritive sweetner. | 08 |
| 150 | Give pharmacognostic account of any one plant sweetner. | 12 |
| 151 | Give pharmacognostic account of any one plant bitter. | 12 |
| 152 | Define the term plant sweetner and give pharmacognostic account of any one plant sweetner. | 12 |
| 153 | Define the term plant bitter and give pharmacognostic account of any one plant bitter. | 12 |
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# BIOTECHNOLOGY

## 16 Mark questions

1. Define fermentation. Explain construction and working of typical Bioreactor.
2. Explain fermentative production of Tetracycline.
3. Explain in detail fermentative production of penicillin.
4. Explain in detail about the downstream process for production of penicillin.
5. Explain in detail fermentative production of Streptomycin.
6. What is protoplast fusion? Write the procedure and mechanism of protoplast fusion. Discuss the importance of protoplast fusion and somatic hybridization.
7. Give construction and working of typical bioreactor.
8. Explain in detail different types of fermenter.
9. What is protoplast fusion? Give mechanism and application of it. Explain germplasm preservation and cryopreservation.
10. Explain in detail fermentative production of any one antibiotic.
11. Explain hybridoma technology for production of monoclonal antibodies along with their applications.
12. Give the production of any two.
    1. Interferon
    2. Human insulin
    3. Somatotropin
13. Explain in details various techniques of plant tissue culture.
14. Define Immunity. Classify it. Explain in detail standardization of Vaccines and Sera's.
15. Define fermentation. Explain in detail about downstream processing and fermentation monitoring.
16. Give the industrial production of vitamin $B_{12}$
17. Explain the fermentation monitoring and give the manufacturing of tetracycline.
18. Explain plant tissue culture and describe cellular totipotency.
19. Describe the preparation and characterization of immunological substances. Comment on Lymphokines.
20. Explain in detail about production, advantages, disadvantages and applications of monoclonal antibodies.
21. Explain the role of plasmids in genetic engineering. Describe the production of interferon and insulin.
22. Give details of fermentation of penicillin with details of strain improvement and downstream processing.
23. Give details of preparation of insulin by rDNA technology. What are first and second generation recombinant insulin.
24. Explain microbial assay methods of antibiotics.
25. Draw a well labeled diagram of typical fermenter. Explain downstream processing of fermentation products.
26. Explain preparation and standardization of vaccines.
27. Describe in detail development of plant tissue culture.
28. Explain plant tissue culture in detail. Describe Cryopreservation.
29. Define plant tissue culture. Explain in detail various techniques of plant tissue culture.

## 10 Mark questions

1. Give details of strain improvement, media, different stages of fermentation and in situ recovery in streptomycin production.
2. Give in detail the method of production of somatotropin.
3. What is protoplast culture? Give details of its salient features, production and its importance.
4. Write about polymerase chain reaction and its applications.
5. Give detail account about rDNA technology and give details of synthesis of interferon.
6. What is enzyme immobilization? Explain various methods of immobilization.
7. Classify and explain different types of fermentor.
8. What are the various steps involved in fermentation? Give details of fermentation and downstream processing of cynocobalamine.
9. What are the various methods of enzyme immobilization? Give their advantages and disadvantages.

## 8 Mark questions

1. Define biotechnology. Give the applications of biotechnology in different areas
2. Explain in detail importance of biotechnology in pharmaceutical sciences.
3. Explain various stages involved in downstream processing.
4. Describe germplasm storage by cryopreservation.
5. Explain in detail scope and application of biotechnology
6. How will you monitor and control different parameters in fermentation.
7. What is downstream processing? Explain in detail.
8. Explain fermentative production of Dextran.
9. Explain the production of vitamin $B_{12}$ by considering the following point: 1. Strain used 2. Inoculum development 3. Fermentation phase 4. Recovery
10. Explain in detail waste discharge and effluent treatment.
11. Write in detail about microbial enzyme.
12. Explain in detail Callus culture .
13. Explain in detail Somatic embryogenesis.
14. What is suspension culture? Explain types of suspension culture.
15. Explain in detail organogenesis.
16. Discuss about germplasm conservation by cryopreservation.
17. Explain microbial assay of antibiotics.
18. Write about In situ recovery of fermentation product.
19. Explain in detail fermentative production of any one vitamin
    1. Vitamin B2 2. Vitamin B 12
20. Explain in detail genetic recombination in animal cell.
21. Describe various methods of In vitro germplasm conservation.
22. Explain in detail human gene therapy.
23. Describe production of Human insulin.
24. Explain in detail what is Polymerase chain reaction along with its application
25. Explain the development of plant tissue culture.
26. Give the application of Monoclonal antibodies in different areas.

27. Describe in detail protoplast fusion.
28. Give industrial manufacturing of tetracycline.
29. Briefly describe the production of human insulin.
30. Explain downstream processing for fermentation of industrial products.
31. Explain in detail gene cloning.
32. Explain the general method for the preparation of bacterial vaccines.
33. Write in detail, the method of preparation, storage and dose of Diphtheria antitoxin.
34. Describe the various control tests used for immunological preparations.
35. Explain hybridoma technology in production of monoclonal antibodies and their applications in clinical diagnosis, immunotherapy and pharmaceutical research.
36. Elaborate the steps involved in the preparation of recombinant DNA products such as interferon and insulin.
37. Explain various methods of extraction, purification of enzymes and its pharmaceutical applications.
38. Explain various techniques involved in gene manipulation and production of insulin by rDNA technology.
39. What are plasmids? Give their importance as cloning vectors.
40. What are the different techniques of animal tissue culture? Give method of preparation of Chick embryo extract.
41. Explain plant tissue culture in detail.
42. Define BOD and COD. Explain waste discharge and effluent treatment methods.
43. Explain fermentation monitoring.
44. Describe about genetic disorders
45. Explain in brief human gene therapy.
46. Explain genetic recombination in animal cell.
47. Describe briefly design of Bioreactor.
48. Describe crypreservation.
49. Explain various types of cloning vectors.
50. Define cellular totipotency. Describe Organogenesis.
51. Explain various gene transfer method.
52. Discuss on quality control of immunological.
53. Give manufacturing of of vit $B_2$ by fermentation process.

4 Mark questions

1. What is fermentation? Give classification of fermenter. Explain in detail any one.
2. Write the role of chromatographic techniques in downstream processing.
3. Explain the production of vitamin $B_2$ by considering following point: 1.Strain used 2. Inoculum development 3. Fermentation phase 4. Recovery
4. Write advantages of suspension culture over callus culture.
5. Coment on ‘ Fermentation as a biochemical process’
6. Write a note on Waste discharge and effluent treatment.
7. Define and classify Plant tissue culture.
8. Write a note on Cellular totipotency
9. Explain in detail about techniques of cryopreservation.
10. Write a note on restriction enzyme
11. What are veterinary vaccines

12. Explain about Interferon
13. Describe cellular totipotency.
14. Write a note on microbial limit test.
15. Write a note on gene machine
16. Write a note on cryopreservation
17. Write a note on genetic engineering
18. Explain mammalian genome
19. Write a note on DNA Vector
20. Explain the role of Polymerase chain reaction in recombination technique.
21. Write a note on Retrovirus.
22. Write a note on DNA hybridization
23. Write a note on Monoclonal antibodies.
24. Write a note on BOD and COD
25. How will you perform assay of antibiotics by turbidimetric method.
26. What are microbial assays? Write advantages and disadvantages.
27. Write a note on Assay of Streptomycin
28. Write a note on Vitamin $B_{12}$
29. Write a note on Minimum inhibitory concentration
30. Define vaccines? Classify the different immunological products.
31. What is a viral vaccine? Give names of two killed or attenuated viral vaccines.
32. Differentiate between: vaccines and Toxoid
33. Differentiate between : Killed vaccines and attenuated vaccines
34. What is an allergenic extracts? Explain
35. Write in short, the method of preparation of 'Tuberculin test toxin'
36. Write a short note on quality control of vaccine
37. What is PTC? Describe cell suspension culture and its growth parameters in detail.
38. Write a note on Enzyme immobilization.
39. Write in short about following applications of monoclonal antibodies: 1. Therapeutic usage 2. Diagnostic usage
40. Explain in detail probes.
41. Write a short note on standards of water used in pharmaceutical industry.
42. Explain need and methods for in situ recovery of fermentation products.
43. Elaborate on biological method of waste discharge.
44. Explain various methods for strain improvement in plant cells.
45. Define and classify vector. Explain various types of vectors
46. Write a note on probe
47. Comment on DNA hybridization.
48. Explain properties and types of cloning vectors.
49. Discuss in brief steps involved in genetic recombination of animal cell.
50. Write a note on immunomodulating substance.
51. Write a note on standardization of immunological products.
52. What are diagnostic antigens? Give Shick test toxin and Tuberculin test toxin.
53. Elaborate o diagnostic skin antigens and allergic extracts.
54. Explain in brief about mammalian genome.
55. Define probes. Give its applications.

**BIOHARMCEUTICS**

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| 01 | Define Pharmacokinetics & explain plasma drug concentration time profile. | 16 |
| 02 | Describe in detail about mechanism of drug absorption. | 16 |
| 03 | Explain about the role of prodrug in overcoming pharmaceutical & pharmacokinetic problems with examples. | 16 |
| 04 | Explain absolute & relative bioavailability. Discuss the methods for evaluation of bioavailability and comment on vitro in vivo correlation. | 16 |
| 05 | Define bioavailability. Differentiate between absolute & relative bioavailability and give the objective of bioavailability. | 16 |
| | Define rate & order of reaction. Derive equation for zero order reaction & mention few processes where zero order reaction is followed. | 16 |
| 06 | Describe in details about mechanism of drug absorption. | 16 |
| 07 | Explain method for studying drug uptake and detail about absorption of drug NON-PER. | 16 |
| 08 | Describe steps in drug distribution and factor affecting drug distribution. | 16 |
| 09 | Explain mechanism of protein drug binding and factor affecting drug related. | 16 |
| 10 | Define biotransformation of drug and explain chemical pathway of biotransformation. | 16 |
| 11 | Define excretion and detail about renal excretion of drug. | 16 |
| 12 | Brief description about concept of renal clearances. | 16 |
| 13 | Define renal clearance nad explain factor affected renal clearance. | 16 |
| 14 | Explain rate, rate constant and order of reaction. | 16 |
| 15 | Explain consideration in *IN- VIVO* bioavailability study design. | 16 |
| 16 | EXPLAIN *IN VIVO - IN VITRO* correlation. | 16 |
| 17 | Explain methods for enhancement of bioavailability. | 16 |
| 18 | Explain bioavailability enhancement through enhancement of drug solubility. | 16 |
| 19 | Explain bioavailability enhancement through enhancement of drug permeability across membrane. | 16 |
| 20 | Explain bioavailability enhancement through enhancement of drug stability. | 16 |
| 21 | Define drug absorption. What are the various routes from which absorption of a drug is necessary for pharmacological action. | 16 |
| 21 | Describe in details about physiological barrier to distribution of drug. | 10 |
| 22 | Enumerate factors affecting absorption of drug & discuss following factors influencing drug absorption | 10 |
| 23 | Explain about absorption of drugs from non invasive transmucosal routes. | 10 |
| 24 | What are various factors affecting renal clearance of drug? Explain non renal routes of drug excretion. | 10 |
| 25 | Explain clearance, total body clearance & what are factors affecting renal clearance of drug? | 10 |
| 26 | Briefly describe methods used for measurement of bioavailability. | 10 |
| 27 | Describe in details about application of Biopharmaceutics study | 10 |
| 28 | Name and define the pharmacokinetic processes involved in the termination of drug action? | 10 |
| 29 | Describe in details about passive diffusion. | 10 |
| 30 | Describe in details about Fick's first law of diffusion. | 10 |
| 31 | Discuss the similarities and differences between passive and facilitated diffusion. | 10 |
| 31 | Explain about binding of drugs to HAS. | 8 |
| 32 | Give the consequences of protein drug binding. | 8 |

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| 33 | Explain factors affecting protein binding of drugs. | 8 |
| 34 | Classify the drug transport mechanisms. | 8 |
| 35 | Explain about bioequivalence studies. | 8 |
| 36 | Describe non renal routes of drug excretion. | 8 |
| 37 | Explain factors affecting renal clearance. | 8 |
| 38 | Short note on phase II reaction. | 8 |
| 39 | Explain methods of evaluating bioavailability. | 8 |
| 40 | Define biotransformation. Comment on role of cytochrome P-450 in biotransformation of drugs. | 8 |
| 41 | Give application of pharmacokinetic model. | 8 |
| 42 | Differentiate between compartment modeling & physiological modeling. | 8 |
| 43 | Draw typical plasma concentration time profile showing pharmacokinetic & Pharmacodynamic parameters after oral administration of single dose of drug. | 8 |
| 44 | Discuss factors affecting biotransformation of drug. | 8 |
| 45 | Explain diffusion layer model for drug dissolution. | 8 |
| 46 | How do gastrointestinal contents affect therapeutic activity of drug? Explain. | 8 |
| 47 | Write a short note on apparent volume of distribution. | 8 |
| 48 | Derive half life for first order rate process. | 8 |
| 49 | Differentiate between plasma protein drug binding & tissue drug binding. | 8 |
| 50 | Write a short note on volume of distribution. | 8 |
| 51 | Give relationship between tissue drug binding & apparent volume of distribution. | 8 |
| 52 | Dissolution is rate limiting step in process of drug diffusion. Explain with suitable example. | 8 |
| 53 | Write a short note on Noyes Whitney equation for dissolution of drug | 8 |
| 54 | Write a short note on Determination of bioavailability | 8 |
| 55 | Explain why drugs are not distributed uniformly in body with examples. | 8 |
| 56 | Briefly describe patient related factor affect absorption. | 8 |
| 57 | Briefly describe drug - drug interaction affect absorption. | 8 |
| 58 | Explain some drugs are absorbed better with food while other is retarded by food. | 8 |
| 59 | Explain factors affecting protein drug binding | 8 |
| 60 | Why distribution of drug is not uniform throughout the body? Comment on ‘apparent volume of distribution’. | 8 |
| 61 | Describe enterohepatic cycle. | 8 |
| 62 | Describe various factors affecting drug metabolism. | 8 |
| 63 | Discuss kinetics of protein binding of drugs & give significance of protein binding. | 8 |
| 64 | Give various characteristics of passive diffusion of drug. | 8 |
| 65 | Explain paracellular transport | 8 |
| 66 | Give brief description about vesicular transport | 8 |
| 67 | | |
| 68 | Write a short note on B.B.B | 8 |
| 69 | Explain transcellular transport | 8 |
| 70 | Write a short note on Bioequivalence studies | 8 |
| 71 | Describe in details about ion pair transport | 8 |
| 72 | Describe in details about active transport | 8 |
| 73 | Explain routes of drug transfer from absorption sites in GIT into the systemic | 8 |

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| | circulation. | |
| 74 | Write a short note on pH partition hypothesis | 8 |
| 75 | Describe in details about phase of drug transfer from GI absorption site into systemic circulation. | 8 |
| 76 | Write a short note on Polymorphism | 8 |
| 77 | Explain Danckwert's model for dissolution of drug. | 8 |
| 78 | Explain difference between absolute & effective surface area. How effective surface area can be increased for hydrophobic drugs? | 8 |
| 79 | Write a short note on Enterohepatic cycling of drug | 8 |
| 80 | Write a short note on Prodrug | 8 |
| 81 | Write a short note on Active & passive transport of drug | 8 |
| 82 | Explain effect of GI transit time on absorption. | 8 |
| 83 | Write a short note on Drug displacement interaction | 8 |
| 84 | Explain pharmaceutical factor affecting drug absorption. | 8 |
| 85 | Write a short note on Vesicular transport | 8 |
| 86 | Explain interfacial barrier model. | 8 |
| 87 | Briefly describe buffers affect absorption. | 8 |
| 88 | Write a short note on Concept of clearance | 8 |
| 89 | Write a short note on Pharmaceutical application of prodrug | 8 |
| 90 | State the factors affecting absorption by Particle size | 8 |
| 91 | Briefly describe pinocytosis | 8 |
| 92 | State the factors affecting absorption by Drug solubility & dissolution rate | 8 |
| 93 | Briefly describe surfactants affect absorption. | 8 |
| 94 | State the factors affecting absorption by Age | 8 |
| 95 | Explain theories of drug dissolution | 8 |
| 96 | Briefly describe phagocytosis | 8 |
| 97 | State the factors affecting distribution of drug. | 8 |
| 98 | Briefly describe diffusion layer model/film theory. | 8 |
| 99 | State the factors affecting absorption by Polymorphism | 8 |
| 100 | State the factors drug dissolution and dissolution rate. | 8 |
| 101 | Explain limited salvation theory. | 8 |
| 102 | Explain salt form of drug affect the absorption. | 8 |
| 103 | Briefly describe manufacturing /processing variables affect absorption. | 8 |

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| 104 | What is the major mechanism for absorption of most drugs. What is the driving force foe such a process.? | 8 |
| 105 | What do you understand by sink condition ? how is it maintained and responsible for complete passive absorption of drugs from the GIT.? | 8 |
| 106 | What are the characteristics of specialized transport system ? how can the kinetics of such processes by described ? | 8 |
| 107 | Differentiate transcellular and paracellular transport. | 8 |
| 108 | Suggest the likely mechanism for oral absorption of following agents: lithium carbonate, ibuprofen, cyanocobalamin, methotrexate, quaternary ammonium compounds and insulin. | 8 |
| 109 | Differentiate passive and active transport mechanisms. | 8 |
| 110 | Protein drugs such as insulin and heprin are not administered orally. Suggest reason. By which routes will you administer these agents if a rapid effect and if prolonged action is desired ? | 8 |
| 111 | In order to admonistered drugs optimally, what factors should be considered in the design of a drug formultion. | 8 |
| 112 | Enlist and illustrate the steps involved in the absorption of a drug from orally administered solid dosage forms. | 8 |
| 113 | Define the rate-determinig step. What are the two major RDS" in the absorption of orally administered drugs? Based on the solubility profile, to which drugs they apply ? | 8 |
| 114 | How are drugs classified according to the Biopharmaceutics Classification System? | 8 |
| 115 | What are the various phase of drug transfer from GI absorption site into the systemic circulation ? | 8 |
| 116 | What is the significance of lymphatic circulation in drug absorption ? | 8 |
| 117 | Classify and enumerate the biopharmaceutics factors influcencing bioavailability of a drug from its dosage form. | 8 |
| 118 | Justify the statement – dissolution rate is better related to drug absorption and bioavailabilty than solubilty. | 8 |
| 119 | Name the various theories that explain drug dissolution. | 8 |
| 120 | What assumptions are madein diffusion layer and dankwert's models. | 8 |
| 121 | What is the difference between absolute and effective surface area ? how can the latter of a hydrophobic drug be increased ? | 8 |

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| 122 | Microionisation of hydrophobic drugs actually results in reduction of effective surface area and dissolution rate. Why ? | 8 |
| 123 | For which drugs increase in surface area by microisation is not advisable ? | 8 |
| 124 | Buffered aspirin tablets are more suitable than sodium salt form of aspirin. Why ? | 8 |
| 125 | What is the influence of the size of counterion on solubilty of salt forms of drugs ? | 8 |
| 126 | State the pH – partition hypothesis briefly. On what assumption this statement is based ? | 8 |
| 127 | State the principle of non – ionic diffusion. | 8 |
| 128 | Discuss the limitation and significance of Ph – partition hypothesis. | 8 |
| | Delayed intestinal transit is sometimes desieable. Why ? | 8 |
| 129 | What are the consequence of various disease states on oral bioavailability of a drug. | 8 |
| 130 | What are the various mechanisms for drug – drug interaction in the GIT ? | 8 |
| 131 | What are the different sites of presytstemic metabolism of orally administered drugs ? | 8 |
| 132 | How would you circumvent the first pass effect of an orally administered drug ? | 8 |
| 133 | How can the metabolic role of colonic microflora be utilized for drug targeting to large intestine ? | 8 |
| 134 | What are the various methods for studying oral absorption of drugs ? | 8 |
| 135 | What are the various mechanisms of drug absorption through skin ? | 8 |
| 136 | Discuss the utility of skin for administration of therapeutic agents. | 8 |
| 137 | How can the absorption of drugs from subcutaneous sites be promoted ? | 8 |
| 138 | Name the special barriers to distribution of drugs. | 8 |
| 139 | Why distribution of a drug not uniform throughout the body ? list the factor affecting drug distribution ? | 8 |
| 140 | Unless distribution occurs, the drug may not elicit pharmacological response. Explain . | 8 |
| 141 | What are the two major rate – limiting steps in the distribution of drugs ? under what circumstances are they applicable ? | 8 |
| 142 | Which physiochemical properties of the drug limit its distriobution ? | 8 |
| 143 | Phenobarbital and salicylic acid have almost the same $K_{O/W}$ but the former shows extensive distribution. Why ? | 8 |
| 144 | What are parameter is considered to be the driving force for distribution of polar drugs ? | 8 |

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| 145 | Describe the anatomy and physiology of blood brain barrier. What characterstics of a drug are necessary to penetrate such a barrier.? | 8 |
| 146 | How do nutrients which are generally polar, make their way into the brain ? | 8 |
| 147 | Polar drugs such as penicillin normally do not cross BBB but do so in meningitis. Explain . | 8 |
| 148 | Name the three approaches by which a polar drug can be targeted to brain. | 8 |
| 149 | How are body tissues classified on the basis of perfusion rate ? | 8 |
| 150 | It is better to express Vd in litres/kg body weight. Why ? | 8 |
| 151 | Which are thefactors responsible for the difference in the drug distribution in person of different age group? | 8 |
| 152 | Can a drug have two or more Vd values ? explain why ? | 8 |
| 153 | Classify the body components to which drugs normally bind. | 8 |
| 154 | When is drug binding considered irreversible ?what could be the consequence of such an interaction ? | 8 |
| 155 | Why HAS considered a versatile protein for drug binding ? | 8 |
| 156 | Binding of drugs to erythrocytes could be as significant as binding to HAS. Explain | 8 |
| 157 | With examples, name the various drug binding sites on HAS. | 8 |
| 158 | List the factors influencing protein binding of drugs. | 8 |
| 159 | Define displacement interaction. What characterstics of the displacer and the displaced drug are important for displacement interaction to be clinically significant ? | 8 |
| 160 | How do acidic drugs such as sulphonamides /NSAIDs precipitate kernicterus in neonates ? | 8 |
| 161 | What is the influence of various disease states on plasma protein level and drug binding ? | 8 |
| 162 | How would the plasma protein drug binding influence sink conditions and absorption of a drug from the GIT ? | 8 |
| 163 | Renal excretion of penicillins is unaffected by protein drug binding. Why ? | 8 |
| 164 | Give examples where binding of an agent to a specific tissues can be used for diagnostic purpose ? | 8 |
| 165 | How can the principle of binding b used for drug targeting ? | 8 |
| 166 | Drive the relationship showing that greater the free concentration of drug in plasma. Larger its Vd. | 8 |

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| 168 | What are the various sites of drug metabolism in the body ? why is liver considered the major site for such process. | 8 |
| 169 | What are the characterstics of microsomal enzyme ? | 8 |
| 170 | Classify the chemical pathways of drug metabolism. | 8 |
| 171 | Which reaction considered phase III reactions ? | 8 |
| 172 | How was the name cytochrome P-450 derived ? why is it considered to be themost important component of mixed - function oxidases ? | 8 |
| 173 | Outline the steps involved in the oxidation of xenobiotics. What rate limiting step in such a process ? | 8 |
| 174 | Unlike aromatic hydroxylation, oxidation of oefins does not generate tissue reactive tissue reactive metabolites. Explain . | 8 |
| 175 | Explain the analogy and distinction between N – dealkylation and oxidative deamination reactions. | 8 |
| 176 | Cite examples of O – dealkylation reactions that yield active metabolites. | 8 |
| 178 | Explain the mechanism responsible for warfarin toxicity due to phenylbutazone co – administration. | 8 |
| 179 | What is the interesting phenomenon observed with acetylation reactions in human race ? | 8 |
| 180 | Define pharmacogenetics. What is the major cause of intersubject variability in drug response ? | 8 |
| 181 | To what factor are the sex related differences in drug metabolism attributed ? | 8 |
| 184 | Define the term Biopharmaceutics | 01 |
| 185 | Define the term Bioavailability | 01 |
| 186 | Define the term Soft drug | 01 |
| 187 | Define the term Pharmacodynamics | 01 |
| 188 | Define the term Absorption Distribution | 01 |
| 189 | Define the term pharmacokinetics | 01 |
| 190 | Define the term therapeutics phase | 01 |
| 191 | Define the term drug absorption | 01 |
| 192 | Define the term drug distribution | 01 |
| 193 | Define the term first pass metabolism | 01 |
| 194 | Define the term disposition . | 01 |
| 195 | Differentiate between active & passive drug transport. | 04 |

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| 196 | Why small intestine is major site for absorption of most drugs. | 04 |
| 197 | Give biopharmaceutical classification system for drug. | 04 |
| 198 | Enlist the characteristics of passive diffusion of drugs. | 04 |
| 199 | Why is the absorption rate of a sufficiently water soluble but lipophillic drug always greater than its rate of elimination.? | 04 |
| 200 | Enlist the characteristics of pore transport mechanism. | 04 |
| 201 | Define and explain significance of absorption window. | 04 |
| 202 | Why are secondary and tertiary alcohols resistant to oxidation ? | 04 |
| 203 | Why is N – dealkylation of tertiary nitrogen rapid in comparison to that of secondary nitrogen? | 04 |
| 204 | N – dealkylation of t- butyl group is not possible. Why ? | 04 |
| 205 | Why are both rapidily and completeness of drug absorption important. What are their significance. | 04 |
| 206 | Why is active transport not a pedominant mechanism for absorption of drugs ? What could be the reason for active absorption of several antineoplastics or nutrient analogues ? | 04 |
| 207 | What are the various types of active transport mechanisms ? give significance of each. | 04 |
| 208 | How are ionic/ionisable drugs absorbed.? | 04 |
| 209 | What is only absorption mechanism for which aqueous solution of drug is not a prerequisite? What is the significance of such a transport process. | 04 |
| 210 | Why is disintegration test not considered a guarantee of a drug's bioavailablity from its solid dosage form? | 04 |
| 211 | The influence of compression force on drug dissolution and absorption from tablets is unpredictable. Explain . | 04 |
| 212 | Quote example of complexation used to enhance bioavailabilty of a drug. | 04 |
| 213 | List the orally administered dosage forms in order of decreasing bioavailability. | 04 |
| 214 | How does the nature and type of dosage form influence drus absorption ? | 04 |
| 215 | Stomach is not the principle site for drug absorption. Explain. | 04 |
| 216 | Why drugs of all types, whether acidic, basic or neutral, are better absorbed from small intestine ? | 04 |
| 217 | For which drugs rapid GE is desirable and when should it be slow ? | 04 |
| 218 | Disscuss briefly the factor affecting GE of drugs. | 04 |

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| 219 | Name the three approaches by which a polar drug can be targeted to brain. | 04 |
| 220 | Drugs that penetrate the CNS slowly may never achieve adequate therapeautic brain concentration . why ? | 04 |
| 221 | In which periods drugs are particularily harmful to foetus in pregant women ? | 04 |
| 222 | Why is the placental barrier not as effective as BBB ? | 04 |
| 223 | How are body tissues classsified on the basis of perfusion rate ? | 04 |
| 224 | Why are phase I reactions called as functionlisation reactions ? | 04 |
| 225 | Why are oxidative reaction predominant in comparison to other phase I reactions ? | 04 |
| 226 | Explain why the oxidative enzyme are called by different names – mixed function oxidases, monooxygenases and hydroxylases. | 04 |
| 227 | Phase II metabolic reactions are true detoxication reactions. Explain. | 04 |
| 228 | What are the outstanding characteristics of conguation reactions ? | 04 |
| 229 | The molecular weight of congugate is important in dictating its route of excretion. Explain . | 04 |
| 230 | Explain why glucuronidation is the commonest and most important of all phase II reactions. | 04 |
| 231 | What aspect of conguagation with amino acids can be put to diagonstic use ? | 04 |
| 232 | Why it is that glucuronidation can take place in most body tissues ? | 04 |
| 233 | Glutathione congugates are not detectable in urine. Why ? | 04 |
| 234 | How is cyanide inactivated in the body ? | 04 |
| 235 | What are the various methods for studying drug metabolism ? | 04 |
| 236 | Why do children require large mg/Kg doses of some drugsin comparison to adults ? | 04 |
| 237 | Neonates are at greater risk from drug intoxication than infaints and children. Explain? | 04 |
| 238 | How does diet influence drug metabolism ? | 04 |
| 239 | Define chronokinetics. What factors govern the diurnal variations in drug metabolism ? | 04 |
| 240 | Define toxicological activation. Classify tissue – reactive metabolites and explain how they are generated. | 04 |
| 241 | What is the biochemical indication of generation tissue – reactive metabolites ? | 04 |
| 242 | What are the various methods for the study of drug biotransformation ? | 04 |
| 243 | How are drugs classified according to BDDCS ? | 04 |
| 245 | Why anhydrous form of drug has grater aqueous solubility than hydrates. | 02 |

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| 246 | How does paracellular transport differ from pore transport. | 02 |
| 247 | It is always advisiable to administer B vitamins in small multiple doses rather thn as a singles large dose. Why ? | 02 |
| 248 | How are ionic/ionisable drugs absorbed ? | 02 |
| 249 | Why are drugs refered to as xenobiotics ? | 02 |
| 250 | How does biotransformation of a drug differ from its chemical instability ? | 02 |
| 251 | what happen if a lippophillic drug that is absorbed into the systemic circulation is not metabolised ? | 02 |
| 252 | What are soft drug with example ? | 02 |
| 253 | In what respect the hydrolytic reactions differ from oxidative and reductive reactions ? | 02 |
| 254 | What is meant by the true reversible and apparent reversible reactions ? | 02 |
| 256 | Why is it that drugs containing primary alcohol groups are rare? | 02 |
| 257 | What physiochemical properties of a drug / metabolite govern its excretion in urine? | 04 |
| 258 | Secretion of an exogenous compound in tubules is an active process but reabsorption is generally a passive phenomenon. Explain. | 04 |
| 259 | Unlike glomerular filtration, active secretion of a drug is unaffacted by protein binding. Explain. | 04 |
| 260 | How can the principle of competitive inhibition of tubular secretion be put to therapeutic use? | 04 |
| 261 | How is the driving force for passive reabsorption of drugs from tubules established? | 04 |
| 262 | Discuss the factor influencing passive reabsorption of drug from tubules. | 04 |
| 263 | List the factor influencing renal excretion of drugs. | 04 |
| 264 | How can the principle of urine pH control and forced diuresis be utilized to treat drug intoxication ? | 04 |
| 265 | What factors govern removal of a substance by haemodialysis ? | 06 |
| 266 | Discuss the factor influencing biliary excretion of drugs. | 08 |
| 267 | How are drugs excreted in bile classified on the basis of bile/plasma ratio ? | 08 |
| 268 | Metabolites and conjugated forms are excreted more in bile than the parent drugs. Why ? | 04 |
| 269 | How can the efficiency of billiary system be tested ? | 04 |
| 270 | Oral contraceptive show double – peak phenomenon after oral administration . Give reason. | 04 |

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| 271 | What factors determine the pulmonary excretion of drugs. ? | 04 |
| 272 | Why should a nursing mother refrain from smoking and taking medication ? | 04 |
| 273 | What is the reason for bitter after taste of medicaments in a patient on drug therapy? | 04 |
| 274 | What is the cause of hypersensitivity skin reaction with some drugs ? | 04 |
| 275 | Enumerate the factor affecting bioavilability of a drug from its dosage form. | 08 |
| 277 | In a bioavialability study, explain how determination of both rate and extent of absorption are important. | 10 |
| 278 | What are the limitation of using oral solution as a standard for determining absolute bioavailabilty. | 06 |
| 279 | Compare single dose with multiple dose bioavailability studies . | 06 |
| 280 | Discuss the merit and demerits of using healthy subjects and patients as volunteers for bioavailability studies. | 08 |
| 281 | What should be the duration of washout period between any two bioavailabilty studies in the same subject ? why ? | 06 |
| 282 | Name the methods of choice in bioavailability dertermination ? on what principle is such a study based ? | 08 |
| 283 | Explain with significance the parameters used in bioavailability determination is done at steady – state and one dosing interval. Explain . | 08 |
| 284 | Why is determination of absorption rate not considered important in the multiple dosing method ? | 06 |
| 285 | What is principle behind assessment of bioavailabilty using urinary excretion studies ? | 06 |
| 286 | Determination of metabolites in urine is not used as a measure of bioavailabilty ? why ? | 08 |
| 287 | Why should the volunteers be instructed to completely empty their bladders while giving urine samples ? | 06 |
| 288 | Why should the frequent sampling of urine/plasma be done intially after drug administration in bioavailabilty determination ? | 06 |
| 289 | Name the parameter examined in urinary excretion data to determine bioavailabilty. What is their analogy with parameters of plasma level studies ? | 06 |
| 290 | What are the drawback of using acute pharmacological response and therapeutic response as measures of bioavailablity ? | 08 |
| 291 | What factor should be considered in the design of dissolution testing models? | 04 |

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| 293 | What are the ideal features expected from dissolution apparatus ? | 06 |
| 294 | What are various compendial dissolution apparatus design ? discuss briefly starting their application. | 08 |
| 295 | What is the importance of similarity factor f2 in dissolution profile comparison ? | 06 |
| 296 | Define Q value . what is the dissolution acceptance critertion as per USP ? | 06 |
| 297 | Disscuss the various levels of *in vitro – in vivo* correlations ? | 06 |
| 298 | Discuss the significnce of biopharamaceutics classification system in determining IVIVC ? | 08 |
| 299 | Define the terms high solubility and high permeability according to BCS. | 08 |
| 300 | What are the various types of bioequivalence studies ? | 06 |
| 301 | What are the circumstances for biowaiver of an in vivo bioequivalence study ? | 08 |
| 302 | Enlist the element of a bioequivalence study protocol. | 06 |
| 303 | How are drugs classified according to biopharmaceutics classification system ? | 08 |
| 304 | Disscuss the methods aimed at enhancing bioavailabilty through enhancement of drug solubility or disssolution rate. | 08 |
| 305 | How are solid solutions classifed ? | 06 |
| 306 | Solid solution dissolve faster than eutectics. Why ? | 06 |
| 307 | Discuss the methods aimed at enhancing bioavailabilty through gastrorentation. | 08 |
| 308 | What are various means by which the particle size of a drug can be reduced submicron level ? | 08 |

**BP IVth yr VIIth SEM**

**DOSAGE FORM TECHNOLOGY -I**

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**Each Question carries 16 marks**

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1. Define tablet? Classify them and explain tablet ingested orally
2. Define coating of tablet? Give its type and explain film coating.
3. Write note on any (any four)?
   a. Lubricant b. Binder c. Diluents d. disintegrating agent e. organoleptic additives
4. What do you mean by sugar coated tablet? Give in brief sugar coating?
5. Explain coating process?
6. Discuss the operation of hand operated capsule filling maching
7. Explain quality control test for tablet.
8. What do you mean by preformulation? Give concept of Preformulation in formulation development.
9. Explain Polymorphism & Drug stability important role in preformulation.
10. Define capsule Classify them and explain manufacturing hard gelatin capsule.
11. Define soft gelatin capsule explain manufacturing process of soft gelatin capsule.
12. Define suppository Explain suppository bases.
13. What do you mean by ointment? Explain ointment bases.
14. Explain formulation preparation and evaluation of suppository.
15. Explain Formulation, preparation and evaluation of lipstick
16. Explain formulation preparation and evaluation of ointments.
17. Define cosmetics? Classify them and give note on vanishing cream and cold cream.
18. Explain preparation and evaluation of tooth powder.
19. Explain preparation and evaluation of face powder.
20. Give in details preparation, formulation & evaluation of shampoo.
21. Describe formulation, preparation and evaluation of moisturizing cream.
22. Explain methods of tablet manufacturing.
23. Explain problem and defect during tablet manufacturing.
24. Explain processing of capsule.
25. Explain material for production & manufacturing of capsule shell.
26. Write note on Microscopy, polymorphism, solubility, dissolution.
27. Explain physical parameters used in preformulation.
28. Define tablet coating .Give its type and explain enteric coating.
29. Explain different types of capsule.
30. Define film coating? Explain aqueous and non aqueous film coating technique.

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**Each Question carries 08 marks**

1. Write note on microscopically examination for preformulation.
2. Write note on polymorphism & solubility.
3. Give account on suppository bases.
4. How the capsule are numbered.
5. State manufacturing defect in tablet.
6. Give account on ointment bases.
7. What do you mean by hard gelatin capsule?
8. Write note on wet granulation method for tablet preparation.
9. Explain manufacturing process of hard gelatin capsule.
10. Give concept of preformulation.
11. Explain tablet coating.
12. Explain enteric coating.
13. Explain Sugar coating method.
14. Give account on film coating.
15. Explain evaluation of capsule.
16. Write note on additives used in tablet.
17. Write note on disintegration and dissolution test for tablet.
18. Explain dentifrices.
19. Write in short evaluation of tablet.
20. Give in detail about preformulation.
21. Explain manufacturing process of soft gelatin capsule.
22. Explain excipients used in tablet.
23. Write note on standard tablet and sustained released tablet.
24. Give account on film coated tablet.
25. Give in detail about sugar coated tablet.
26. Explain factor that affect drug absorption from ointment base.
27. Write note on displacement value.
28. Explain film coating material.
29. Write a note on method of filling hard gelatin capsule.
30. Write note on Dry granulation.
31. Explain process coating.
32. Write note on additives used in capsule.
33. Explain fundamental concept of cosmetics.
34. Explain Formulation and preparation of lipstick.
35. Describe film forming agent.
36. Describe tablet adjuncts.
37. Explain coating defect.
38. Explain evaluation of ointment
39. What do you mean by tablet standardization?
40. Write a note on disintegration test for tablet.

**Each Question carries 04 marks**

1. Define tablet? Classify them with example.
2. Give the application of soft gelatin capsule.
3. Give merits and demerits of capsule
4. Write note on packaging and storage of suppository
5. Define preformulation? give various parameter used for development of new drug
6. Write note on drug stability
7. Give account on polymorphism.
8. Described hardness tester used for measuring hardness of tablet.
9. What are the various tests for evaluation of tablet?
10. What do you mean by compression coating?
11. Write note on organoleptic additives.
12. Write note on suppository
13. What do you mean by ointment bases? Give its classification
14. Write note on solubility.
15. Define suppository? Give its type with example
16. What do you mean by ophthalmic ointment?
17. Give advantages and disadvantages of tablet.
18. Write note on pan coating
19. Draw neat label diagram of single tablet punching machine
20. Draw Schematic diagram of wet granulation
21. Draw Schematic diagram of dry granulation
22. Draw Schematic diagram of compressed tablet
23. What are the different types of capsule?
24. Give advantages of film coating over sugar coating.
25. Give account on vanishing cream.
26. Give advantages of dentifrices.
27. write note on sublingual tablet
28. Give account on tablet triturates.
29. State on sustained released tablet
30. Classify different types Tablets.

# PHARMACEUTICAL MEDICINAL CHEMISTRY-II

1. Give a brief account on Anthelmentics and provide suitable example wherever necessary. 8M
2. How would you classify Anthelmentics on the basis of chemical structure, Give the structure, chemical name and uses of one example from each category? 8M
3. Discuss synthesis of following drugs. 8M
   a. Albendazole b. Thiabendazole
4. Give mechanism of action of Benzimidazole derivatives, acting as an Anthelmentics. 8M
5. Give mechanism of action of piperazine derivatives as an Anthelmentics.4M
6. Give structure, IUPAC name of any two piperazine derivatives.4M
7. Classify sulphonamides on the basis of their site of action, Give structure, chemical name and uses of any one potent drug from each category. 8M
8. How would you synthesize sulphanilamide from a) Acetanilide b) Benzene c) sulphanilic acid. 8M
9. Give structure, IUPAC name and uses of following. 8M
   a. Sulphapyridine b. sulphathiazole c. sulphadiazine d. sulphacetamide
10. Explain sulphonamide used in urinary tract infection Give synthesis of any one drug. 8M
11. Explain sulphonamide used in burn therapy Give synthesis of any one drug. 8M
12. Give comphrensive account of the mode of action of sulphonamides with examples 8M
13. Write a short note on chemotherapeutics consideration of sulphonamides. 8M
14. Explain with structures sulphonamides used in intestinal infection, Give synthesis of any one drug. 8M
15. Explain with structures Sulphonamide used for local infection. Give synthesis of any one drug. 8M
16. a. Give SAR of Sulphonamides. 4M
    b. Give structure and chemical name of following drugs. a. sulphisoxazole b. sulphathiazole 4M
17. Classify the Antitubercular drug on the basis of line of treatment, Give structure, chemical name, and uses of at least one potent drug from each category.8M
18. Give detail account on pyrazinamide along with synthesis, mode of action, and uses.8M
19. Give structure, mode of action and synthesis of Isoniazid. 8M.
20. Give structure, mode of action and synthesis of Ethambutol 8M.
21. How would you classify Antineoplastic agents, Give structure, chemical name and uses of one important member from each category? 8M
22. Give a brief account of Alkylating agents as an Anticancer by giving suitable examples. 8M
23. Give a brief account of Mustard derivatives as an Anticancer by giving suitable examples. 8M
24. A. How would you classify Antimetabolites 6M
    B. Give structure, chemical name and uses of followings. a. Methotrexate b. Mercaptopurine

c. Fluorouracil 6M

25. Give a brief account on Antibiotics as an important class of Antineoplastic agents. 8M
26. Classify plant products employed in treatment of Malignant tumor, Give structure, chemical name and uses of one potent drug. 8M
27. Give a comprehensive account of Hormone as an Antineoplastics support your answer with suitable examples. 8M
28. Classify the Antiviral drug on the basis of their mode of action. Give structures, chemical name, and uses of at least one potent drug. 8M
29. A. Discuss Interferon as Antiviral agents. 4M
    B. Write a short note on Antileprotics
30. Give the name of three imporantant drugs that specifically interfere with viral nucleic acid replication. Discuss the synthesis of any one drug.8M
31. Give the structure, chemical name, and uses of two important Antiviral drugs that affect translation on cell ribosome, and discuss synthesis of any one drug. 8M
32. Discuss the followings. 8M
    a. Important Antiviral drugs
    b. Mode of action of Antiviral drugs
33. How would you classify the oral hypoglycemic agents, Give structures, chemical name and uses of at least one potent drug. 8M
34. Give a brief account of followings with a few important examples. 8M
    a. First generation sulphonylurea
    b. Second generation sulphonylurea
35. Give synthesis of any two drugs. 8M
    a. Chlorpropamide b. Tolbutamide c. Glipizide
36. Give a comprehensive account on Thiazolindione as hypoglycemic 8M
37. a. Write a short note on Hypoglycemic agents
    b. Write a short note on α glucosidase inhibitors
38. What is causal organism responsible for malaria, How do the Antimalarial affects the life cycle of mosquito? Explain 8M
39. With the help of general structure, Give the status of four important alkaloids isolated from Cinchona bark. 8M
40. Classify the synthetic Antimalarial based on their basic chemical nucleus, Give example of at least one drug from each class. 8M
41. A. Name important Antimalarials derived from 4-amino 7 chloro Quinoline.4M
    B. Give synthesis of Chloroquin. 4M
42. A. Name important Antimalarials derived from 8-amino 6 methoxy Quinoline.4M
    B. Give synthesis of primaquine. 4M
43. What are diuretics, classify diuretics by citing the structures, chemical name, and uses of at least any one drug from each category. 8M
44. A. Give brief account on mercurial diuretics. 4M
    B. Give synthesis of Furosemide 4M
45. Give benzothiadiazine as an important class of diuretics, Give structure, chemical name, and uses of any four official compound.8M
46. A. Give synthesis of Dapsone 4M

. B. Discuss mode of action of Antimalarials 4M
47. Give synthesis of a. Chlorothiazide b. Bumetanide 8M
48. Write a brief account on Carbonic unhydrase inhibitors. 8M
49. Give synthesis of a. Acetazolamide b. Ethoxzolamide 8M
50. Explain High-ceiling diuretics with examples, Give synthesis of any one drug 8M
51. With the help of specific examples give an account on followings 8M
    a. Osmotic diuretics b. Loop diuretics
52. Discuss mode of action of following class of diuretics.8M
    a. Thiazides b. Carbonic unhydrase inhibitors c. Mercurial diuretics
53. Discuss SAR of Mercurial diuretics and Thiazides diuretics. 8M
54. What structural differences occurs in 4-aminoquinoline and 8-aminoquinoline derivatives of Antimalarials, support your answer by giving suitable examples. 8M
55. a. Write a note on Polycyclic Antimalarials 4M
    b. Give synthesis of Mefloquin 4M
56. a. Why combination therapy is applied in treatment of Tuberculosis 4M
    b. Why Sulphamethoxazole and Trimethoprim is given in combination. 4M

57. Explain drug design based on traditional analog and QSAR studies. 8M
58. a) Classify antiviral agents. Synthesis of Acyclovir and Amantadine. 8M
    b) SAR of Sulphonamides. 4M
59. Classify Antitubercular agents, synthesis of INH and Para Amino salicylic acid. 8M
60. Give Synthesis of DEC and Thiabendazole. 8M
61. Give Synthesis of sulphacetamide and sulphamethoxaole. 8M
62. History and current status of pencillins.8M
63. MOA of alkylating agents. Write the structure and uses of Pipobroman.8M
64. List vasodilators with structure. 8M
65. Give Synthesis of Methyldopate HCL and Hydralazine. 8M
66. Write short note on Antithrombolytics 4M.
67. Give Structure and uses of Phenformin.4M
68. Give Structure and uses of Minoxidil. 4M
69. Write structure of any two Antiprotozoal agents. 4M
70. Define antihypertensive, antianginal, Antiarrythmic and vasodilator drug giving example along with structures, Write in general about mode of action of antihypertensive agent and also give synthesis of any two antihypertensive drugs.16 M
71. What are tetracycline, discuss the structures and chemistry of it, Give synthesis in general of tetracycline group.16M
72. Give life cycle of malarial parasite, classify Antimalarial with examples and structures, Write in general mode of action and synthesis of any one Antimalarial drug.16M
73. Give structures of clinically used β lactum antibiotics; discuss how structure modification in basic penicillin nucleus produces penicilinase resistant oral and parenteral penicillin, Support your answer by giving suitable examples.16M
74. Attempt any four of following.16M
    a. Discuss mechanism of action of tetracycline.

b. Write structure, IUPAC name, SAR of trimethoprim.
c. Give synthesis of pyrazinamide.
d. Give structure, IUPAC name, uses of methotrexate.
e. Give SAR of β lactum antibiotics.
f. Give synthesis of Ethoxazolamide.

75. What is an antibiotic, classify antibiotics with suitable example, Give SAR & mechanism of action of aminogycoside antibiotics, give SAR of Tetracycline.16M
76. Solve following.16M
    a. Give SAR and mechanism of action of sulphonamides.
    b. Explain oral hypoglycemic agent with suitable examples.
77. Solve following.16M
    a. Classify antiviral agent giving structure, mode of action, IUPAC name of one drug from each class.
    b. Discuss drug combination therapy in tuberculosis treatment and outline synthesis of pyrazinamide.
78. Write structure, IUPAC name, and mechanism of action and uses of following (any four).16M
    a. Captopril b. Prazosine c. Acetazolamide d.Guanithidine e. Ethambutol
79. What are antimicobacterium agents, write their structures and specific uses, Give relevant combination used in therapy and write synthesis of ethambutol.16M
80. Discuss in detail the objective and common approaches of drug design with respect to physicochemical properties of design.16M
81. Give in general mode of action of sulphonamides and give its structures and synthesis of any one drug.8M
82. a. Give SAR of Thiazides diuretics.4M
    a. Write about antianginal drugs.4M
83. Give structures of pyrimidine and purine analogs used as Antineoplastic agents, discuss their mode of action.8M
84. Name tricyclic amine which inhibits penetration of viral particle into the host cell, give structures and medicinal importance of them.8M
85. Discuss about antifungal agents with N-Substituted imidazole and triazole nuclei, give their mode of action.8M
86. Define diuretics with example and structure, give details account of carbonic unhydrase inhibitors. 8M
87. Explain how 4-aminoquinoline is related to 8-aminoquinoline to show Antimalarial activity, give synthesis and mode of action of 4-amonoquinoline.8M
88. a. Losartan and Telmisartan belong to which category and draw their structure.4M
    b Discuss SAR of organomercurials.4M
89. a. Write synthesis of chlorthiazide.4M
    b Give SAR of benzothiadiazine diuretics.4M
90. Classify antihypertensive agent with examples and structure and explain ACE Inhibitors.8M
91. Short note (any two) 8M
    a. Hypoglycemic agents b. Antianginal drugs c. Antiarrythmic agents
92. Short note on (any two)16M

a. Antifungal agent b. Antiviral agent c. Antitubercular d. Antileprotics

93. Draw structure, IUPAC name, mode of action and uses of any two antihyperlipidemics. 8M

94. Write short note on plasma expander and anticoagulant.8M

95. Write structure and IUPAC name of any four.8M

a. Warfarin b. Tolbutamide c. Furosemide d. Dipyridamole e. Minoxidil

96. Explain the terms with regarding to Hypertension.8M

a. Systolic BP b. Diastolic BP c. Essential Hypertension d. Renal Hypertension

97. How would you explain the Renin angiotensin system and Hypertension. 8M

98. How would you classify the antihypertensive agents, Give the name, uses and chemical structure of at least one from each category? 8M

99. Discuss the synthesis of any three antihypertensive agents given below. 12M

A. Clonidine B. Guanithidine C. Guanabenz D. Propranolol

100. Give the name, chemical structure and uses of vasodilators, Give synthesis of any one drug. 8M

101. What are antianginal agents, Discuss the Dihydropyridines with particular reference to 12M

a. First generation Ca blockers b. Second generation Ca blockers

102. A. Describe the Nitrate and Nitrites as an Antianginal 8M

B. Write a short note on Cardiotonics.8M

103. What do you mean by QSAR Explain, How do we classify the physicochemical properties in QSAR, Give suitable examples. 8M

104. Give a brief account on the History and development of QSAR.8M

105. Write a short note on following

a. QSAR model b. Drug Receptor Interaction c. Bioisosteric replacement

106. Write a brief account on a. 2D QSAR Analysis b. 3D QSAR Analysis

107. Discuss the various factors governing drug design. 8M

108. Elaborate the rational approach to drug design. 8M

109. Discuss the various possible approaches in designing newer drug by applying variation of a ‘biological active prototype. 8M

110. Give a comphrensive account of the importance of Isosterism and Bioisosterism in Drug Design.8M

111. What do you mean by Molecular Modeling, What are two major aspects of Molecular Modeling, Explain? 8M

112.Discuss briefly Molecular Mechanics and Quantum Mechanics associated with Molecular Modeling.8M

113. Describe the various methodologies for Docking 8M

114. Explain Computer Aided Drug Design Method. 8M

115. Leaves of Digitalis Lanata gave two important glycosides. Give the structure, chemical name and uses.8M

116. Clonidine, Hydralazine, Methyldopa, and Diazoxide are potent ‘Antihypertensive Drug’ Give their structure, chemical name, and uses of each of these.8M

117. Discuss mode of action of some Antihypertensive Drug and give their structures and chemical name.8M
118. Give a comprehensive account of 'Antiarrythmic Agents' used as cardiovascular drug. Support your answer with at least one example from each category.8M
119. Give comphrensive account of membrane stabilizing agents used as an 'Antiarrythmic agents' Give synthesis of any one drug. 12M
120. Give comphrensive account of agents prolonging cardiac action used as an 'Antiarrythmic agents' Give synthesis of any one drug.12M
121. Explain mode of action of membrane stabilizing agents and membrane depolarizing agents. 8M.
122. Explain mode of action of Calcium blockers and vasopressor agents. 8M.
123. Discuss the synthesis of any one of the following membrane stabilizing agents act as an Antiarrythmic,
    a. Disopyramide b, Procainamide c. Tocainide
124. Discuss about class I Antiarrythmic agents, by giving general mode of action, structure, chemical name and uses of any one potent drug. 8M
125. Discuss about class II Antiarrythmic agents, by giving general mode of action, structure, chemical name and uses of any one potent drug. 8M
126. Discuss about class III Antiarrythmic agents, by giving general mode of action, structure, chemical name and uses of any one potent drug. 8M
127. Discuss about class IV Antiarrythmic agents, by giving general mode of action, structure, chemical name and uses of any one potent drug. 8M
128. Discuss Antisympathatic drug Propranolol Hydrochloride and Give it's synthesis from alpha Naphthol.8M
129. Discuss synthesis of Verapamil Hydrochloride and Describe it's mode of action. 8M.
130. Write a short note on Ganglionic Blocking Agents. 8M
131. Discuss mode of action of Dapsone and give it's synthesis.8M
132. What are four cardinal requirements of a substance to be called as Antibiotics. 8M?
133. Give the structure, chemical name and other name of the six naturally occurring Penicillins. 8M
134. What are Aminogycosides antibiotics, Give the structure, and uses of any three potent drugs.8M
135. Give SAR of beta lactum antibiotics. 8M
136. Give SAR of Aminogycosides. 8M
137. Give general structure of cephalosporin, and Give structure, chemical name and uses of any three potent derivatives of cephalosporin's 8M]
138. Give general structure of Penicillin, and Give structure, chemical name and uses of any three potent derivatives of penicillin. 8M
139. Give general structure of Tetracycline and Give structure, chemical name and uses of any three potent derivatives of Tetracyclines 8M
140. Give general structure of Marolides, and Give structure, chemical name and uses of any three potent derivatives of Marolides 8M
141. Give SAR of Tetracyclines 8M
142. Give SAR of Marolides. 8M

143. Explain penicilinase resistant penicillin. 8M
144. Write a note on beta lactamase inhibitors. 8M
145. Give SAR of Chloramphenicol.4M
146. A. Discuss the salient feature of Tetracyclines.8M
    B. Give a brief account of SAR of Tetracyclines.
147. Elaborate the characteristics of Tetracyclines with references to effect of strong acid and strong base.8M
148. Elaborate the characteristics of Tetracyclines with references to effect pKa and Epimerization.8M
149. Give a comprehensive account of a Cephalosporines and provide appropriate examples. 8M
150. Give a comprehensive account of derivatives of Erythromycins. 8M
151. Describe in details antibiotics affecting bacterial cell wall. 16M
152. Describe in details antibiotics affecting bacterial protein synthesis 16M
153. Explain polypeptide antibiotics. 16M
154. Describe the effect of pH and beta lactamase enzyme on structure of penicillin.8M
155. Describe the hydrolytic degradation of Cephalosporines 8M
156. Explain chemistry of penicillin 8M
157. Explain chemistry of cephalosporines 8M
158. Explain chemistry of Aminogycosides. 8M
159. Explain chemistry of Tetracyclins 8M
160. Write a note on coagulant and anticoagulant 8M
161. Give a SAR of Coumarine 4M
162. Write a note on Fibrinolytics. 4M
163. Write a note on Antiplatelets 4M
164. Write a note on plasma volume expander.4M.

# PHARMACEUTICAL ANALYSIS IV

1. Write a note on Partition coefficient. (4)
2. Write a note on Oxygen combustion flask method. (4)
3. Write a note on ISO guidelines. (4)
4. Write a note on ICH guidelines. (4)
5. Write a note on liquid-liquid extraction. (4)
6. Write a detail note on Nitrite titrations. (4)
7. Write a detail note on kjeldahls method of nitrogen estimation. (4)
8. Write a detail note on Oxygen combustion flask. (4)
9. Write a detail note on Karl fischer titration. (4)
10. Write a detail note on determination of alcohol in galenicals. (4)
11. Explain about principle, instrumentation and application of Mass spectroscopy. (16)
12. Explain about principle, instrumentation and application of Nuclear magnetic resonance spectroscopy. (16)
13. Explain about principle, instrumentation and application of Raman spectroscopy. (16)
14. Explain about theory, instrumentation and application of Electron spin resonance. (16)
15. Explain about theory, instrumentation and application of X-ray diffraction. (16)
16. Write in detail the Principle and Applications Radio-immunoassay. (16)
17. Discuss about principle, instrumentation and application of mass spectroscopy. (16)
18. Explain about principle, instrumentation and application of NMR spectroscopy. (16)
19. Solve any four. (16)
    a) Electrophoresis
    b) Radio-Immuno assay
    c) Karl-Fischer titration
    d) Kjeldahl's method
    e) Molecular ion.
20. Give a detail account on Theory, Presentation of the ESR spectrumElectron spin resonance**.** (16)
21. Write note on photocolorimetry. (8)
22. Write note good laboratory practices (GLP). (8)
23. Discuss about solid-solid extraction. (8)
24. Give in brief about x-ray diffraction. (8)
25. Write in detail about chemical shift. (8)
26. Give a detail account on solvents used in NMR spectroscopy. (8)
27. Give a detail account on Chemical shift and its measurement. (8)

28. Write note nitrate titrations. (8)
29. Give a detail account on factors influencing chemical shifts. (8)
30. Give a detail account on instrumentation X-ray diffraction. (8)
31. Give a detail account on Presentation of the ESR spectrum. (8)
32. Give a detail account on hyperfine splitting. (8)
33. Give a detail account on basic principle and Instrumentation single focusing mass. (8)
34. Give a detail account on basic principle and Instrumentation double focusing Quadra pole mass spectrometer .(8)
35. Give a detail account on determination of g value, deviation, line width and Applications of Electron spin resonance. (8)
36. Write detail note on Instrumentation and applications Nuclear magnetic resonance spectroscopy. (8)
37. Discuss in detail Characteristics, Properties and Mechanism Raman spectroscopy. (8)

# CLINICAL PHARMACOTHERAPEUTICS-I

1. a) Explain the role of pharmacist in essential drug concept. 8M
   b) Discuss the role of pharmacist in rational drug formulation. 8M
2. a) Explain the therapeutic management of hypertension with special reference to drug of choice. 10M
   b) What is hypertension, give its etiology 6M
3. Explain the Pharmacotherapy and management of anginal pectoris. 16M
4. a) What is atherosclerosis? Explain the development of atherosclerosis.8M
   b) Explain the therapeutic management of atherosclerosis. 8M
5. a) Explain the etiopathogenesis of heart failure. 10M
   b) Discuss the pharmacotherapy of Congestive Heart Failure. 6M
6. a) Explain arrhythmogenesis and discuss the anti-arrhythmic drugs. 16M
7. Discuss the etiology , pathophysiology and pharmacotherapy of asthama. 16M
8. A) What is acute renal failure, discuss the pathophysiology of ARF. 8M
   B) Explain the therapeutic management of acute renal failure. 8M
9. A) Discuss the pharmacologic agents used in the management of venous thromboembolism. 8M
   B) Discuss the etiology and pathophysiology of venous thromboembolism. 8M
10. A) Discuss the pathophysiology of Rheumatoid arthritis. 8M
    B) Give the therapeutic treatment of Rheumatoid arthritis. 8M
11. A) Discuss the pharmcotherapy of chronic obstructive pulmonary disease. 8M
    B) Explain the etiology and pathophysiology of COPD. 8M
12. A) Discuss the etiopathogenesis of parkinsonism. 8M
    B) Discuss the pharmacological approach for the treatment parkinson's disease. 8M
13. A) Give the pathophysiology of Alziemer's disease. 8M
    B) Give the pharmacotherapeutic approach for the treatment of Alziemer Disease. 8M
14. A) Give the pathophysiological mechanism of osteoarthritis. 8M
    B) Explain the pharmacotherapeutic approach of osteoarthritis. 8M
15. A) Discuss the etiology and pathophysiology of Gout. 8M
    B) Discuss the effective treatment for Gout. 8M
16. A) What is Ischemic heart disease, explain the pathophysiology of Myocardial Infarction. 8M
    B) Give the pharmacotherapeutic approach for the treatment of Myocardial Infarction. 8M
17. Explain the therapeutic outcomes for the treatment of hyperlipidaemias. 16M
18. A) Discuss the etiopathogenesis of Peptic Ulcer 8M
    B) Discuss the pharmacotherapy of Peptic Ulcer. 8M
19. A) Write a short note on a 1) Chron's Disease. 2) Ulcerative Colitis 8M
    B) Discuss the etiopathogenesis of Inflammatory Bowel Disease. 8M
20. A) Discuss the pathophysiology of Systemic Lupus Erythmatosus. 8M
    B) Give the pharmacological treatment of Systemic Lupus Erythmatosus. 8M
21. Classify different types of anaemia, explain the pathophysiology and treatment of anaemia. 16M
22. Explain the role of pharmacist in rational drug use. 16M
23. What is essential drug concept. 4M
24. What are rational drug formulations. 4M
25. Explain the etiopathogenesis of hypertension. 8M
26. Explain the etiology of hypertension. 4M
27. Explain the pharmacotherapy of hypertension. 8M
28. Explain the management of treating hypertension. 8M

29. Explain the pathophysiology of hypertension. 8M
30. Explain the etiology of angina pectoris. 4M
31. Explain the pathophysiology of angina pectoris. 8M
32. Explain the pharmacotherapy of angina pectoris. 8M
33. Explain the pathophysiology of atherosclerosis. 8M
34. Explain the treatment of atherosclerosis. 8M
35. Explain the pathophysiology of congestive heart failure. 8M
36. Explain the pharmacotherapy of CHF. 8M
37. Explain the treatment of arrhythmia. 8M
38. Explain the etiology of arrhythmia. 8M
39. Explain the etiology of myocardial infarction. 8M
40. Explain the pathophysiology of myocardial infarction. 8M
41. Explain the treatment of hyperlipidaemia. 8M
42. Explain the metabolism of lipoproteins. 8M
43. Write in short about thromboembolic disorders. 8M
44. What is treatment approach of thromboembolic disorders? 8M
45. Describe shortly the anaemia. 8M
46. Explain the pathophysiology of bronchial asthama. 8M
47. Explain the treatment of bronchial asthama. 8M
48. Explain the pathophysiology and treatment of COPD. 16M
49. Write a short note on a) allergic rhinitis. B) cystic fibrosis 16M
50. Write a short note on a) common cold. B) cough 8M
51. Explain the pathophysiology of peptic ulcer. 8M
52. Explain the treatment approaches of peptic ulcer. 8M
53. Explain the pharmacotherapy of peptic ulcer. 8M
54. Explain the pharmacotherapy of inflammatory bowel disease. 8M
55. Explain the various liver disorders. 16M
56. Explain the treatment of liver cirrhosis. 8M
57. Explain the pathophysiology of liver cirrhosis. 8M
58. Explain the pathophysiology of parkinson's disease. 8M
59. Explain the pathophysiology of alziemer disease. 8M
60. Explain the pathophysiology of renal failure. 8M
61. Explain the pathophysiology of chronic renal failure. 8M
62. Explain the pathophysiology of acute renal failure. 8M
63. Explain the pathophysiology of benign prostatic hypertrophy. 8M
64. Explain the pathophysiology of infertility. 8M
65. Explain the pathophysiology of rheumatoid arthritis. 8M
66. Explain the pathophysiology of osteoarthritis. 8M
67. Explain the pathophysiology of gout. 8M
68. Explain the pathophysiology of spondylitis. 8M
69. Explain the pathophysiology of systemic lupus erythmatosis. 8M
70. Explain the pharmacotherapy of renal failure. 8M
71. Explain the pharmacotherapy of acute renal failure. 8M
72. Explain the pharmacotherapy of chronic renal failure. 8M
73. Explain the pharmacotherapy of benign prostatic hypertrophy. 8M
74. Explain the pharmacotherapy of male infertility. 8M
75. Explain the pharmacotherapy of female infertility. 8M
76. Explain the pharmacotherapy of systemic lupus erythmatosis. 8M
77. Explain the treatment of Parkinson disease. 8M
78. Explain the treatment of alziemer disease. 8M
79. Explain the treatment of behavioral disorder. 8M
80. Explain the treatment of renal failure. 8M
81. Explain the treatment of acute renal failure. 8M
82. Explain the treatment of chronic renal failure. 8M
83. Explain the treatment of benign prostatic hypertrophy. 8M

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| 84. Explain the treatment of male infertility. | 8M | |
| 85. Explain the treatment of female infertility. | 8M | |
| 86. Explain the treatment of menopause. | 8M | |
| 87. Explain the treatment of rheumatoid arthritis. | 8M | |
| 88. Explain the treatment of osteoarthritis. | 8M | |
| 89. Explain the treatment of gout. | | 8M |
| 90. Explain the treatment of spondylitis. | 8M | |
| 91. Explain the treatment of systemic lupus erythmatosus. | 8M | |
| 92. Write in short about dysmerrhoea. | 4M | |
| 93. Write in short about menopause. | 4M | |

**PHARMACOGNOSY-V**

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| | **3. Alkaloids** | |
| 1 | Define and classify alkaloid with suitable examples. | 08 |
| 2 | Define alkaloids and write in detail about its occurrence and properties. | 08 |
| 3 | Describe in detail about biosynthetic pathway of Tropane alkaloids. | 12 |
| 4 | Describe in detail about biosynthetic pathway of Isoquinoline alkaloids. | 12 |
| 5 | Describe in detail about biosynthetic pathway of Quinoline alkaloids with one drug as example. | 16 |
| 6 | Write in detail about biological source, properties, isolation of ephedrine. | 12 |
| 7 | Explain analysis, estimation and isolation of quinine from cinchona powder. | 16 |
| 8 | Explain the procedure for the isolation of atropine from atropa plant. Draw chemical structure and write molecular formula of it. | 12 |
| 9 | Discuss cinchona as per its pharmacognostic scheme. | 10 |
| 10 | Write biological source and explain the life cycle of ergot. | 08 |
| 11 | Write a short note on steroidal alkaloid by giving one herbal drug example. | 10 |
| 12 | Give pharmacognostic account of opium pod. | 10 |
| 13 | Draw well labelled diagram of periwinkle leaf. | 05 |
| 14 | Give synonyms, biological source, chemical constituent, use and structure of<br>a) Nux vomica b) Opium c) Vasaka d) Colchicum | 12 |
| 15 | Define and classify alkaloid. Write a note on its properties and occurrence. | 10 |
| 16 | Elaborate the drug Ashwagandha as per its systematic Pharmacognosy. | 12 |
| 17 | Elaborate the drug Ergot as per its systematic Pharmacognosy. | 12 |
| 18 | Elaborate the drug Ephedra as per its systematic Pharmacognosy. | 12 |
| 19 | Give specified chemical test of Datura, Cinchona, Ergot and Tea. | 8 |
| 20 | Write a short note on chemical tests<br>a) Murexide colour reaction.<br>b) Thalleoquin test.<br>c) Vitali Morin test.<br>d) Van-Urks reagent. | 12 |
| 21 | Define the term alkaloids. Give detail chemical classification of alkaloids with heterocyclic structures. | 10 |
| 22 | Write a short note on the chemical tests for alkaloids. | 06 |
| 23 | Give isolation and extraction techniques for alkaloids. | 08 |
| 24 | Give biological source, chemical constituents and uses of any two drugs belonging to indole alkaloid category. | 08 |
| 25 | Give synonym, biological source, chemical constituents and uses of any one drug belonging to purine alkaloid category. | 08 |
| 26 | Give synonym, biological source, chemical constituents and uses of any one drug belonging to isoquinoline alkaloid category. | 08 |
| 27 | Give synonym, biological source, chemical constituents and uses of any one drug belonging to amino alkaloid category. | 08 |
| 28 | Give synonym, biological source, chemical constituents and uses of any one drug belonging to steroidal alkaloid category. | 08 |
| 29 | Give Pharmacognosy of Ergot along with its life cycle. | 16 |
| 30 | Write a short note on varieties of cinchona. | 08 |
| 31 | Give the biological source of Cinchona along with its estimation parameter. | 08 |

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| 32 | Give the biological source of Ephedra. Along with its estimation parameter. | 08 |
| 33 | Give the biological source of Belladonna leaf along with its estimation parameter. | 08 |
| 34 | Write a short note on Ipecacunha. | 08 |
| 35 | Draw a labelled diagram of Datura Leaf. | 06 |
| 36 | Give the chemistry of Tropane alkaloid. | 08 |
| 37 | Give the Pharmacognosy of Pilocarpus. | 08 |
| 38 | Give the Pharmacognosy of Opium alkaloid. | 08 |
| | **4. Flavonoids** | |
| 39 | Define and classify flavonoids with suitable examples. | 10 |
| 40 | Define flavonoids and explain the chemistry of it in detail. | 08 |
| 41 | Illustrate the general method of extraction of flavonoid with its general properties. | 08 |
| 42 | Explain the term flavonone with its structure and write in short about glychirrihiza. | 08 |
| 43 | Discuss the drug Green tea and Grape fruit. | 10 |
| 44 | What do you mean by flavones? Discuss its chemistry in short with suitable herbal example. | 08 |
| 45 | Write a short note on chemistry of flavonoids. | 08 |
| 46 | Define flavonoids and give its general method of extraction of flavonoid. | 10 |
| 47 | Write a short note on flavanone flavonoid with any one crude drug as example. | 08 |
| 48 | Write a short note on green tea as flavonoid. | 08 |
| 49 | Write a short note on buck wheat as flavonoid. | 08 |
| 50 | Write a short note on liquorice as flavonoid. | 08 |
| 51 | Write a short note on ginkgo as flavonoid. | 08 |
| 52 | Write a short note on citrus peel as flavonoid. | 08 |
| 53 | Write a short note on grape fruit as flavonoid. | 08 |
| 54 | Give the detail chemistry of Flavonoid. | 06 |
| 55 | Write a short note on Passiflora incarnate. | 08 |
| | **5. Study of Traditional Drugs** | |
| 56 | Give pharmacognostic account of Punarnava with its pharmacology aspects. | 10 |
| 57 | Write down the Biological Source, Family, Chemical Constitution , Pharmacological uses of<br>a) Tulsi<br>b) Guduchi<br>c) Garlic<br>d) Artemisia<br>e) Ashoka | 16 |
| 58 | Give pharmacognostic account of Tylophora with its pharmacology aspects. | 08 |
| 59 | Give pharmacological uses of<br>a) Tulsi<br>b) Garlic<br>c) Shilajit<br>d) Saffron | 10 |
| 60 | Define the herbal drug and give pharmacological uses of Ashoka. | 06 |
| 61 | Define the herbal drug and give pharmacological uses of Kantkari. | 06 |
| 62 | Define the herbal drug and give pharmacological uses of Guggul. | 06 |
| | **6. Herbal Drug Interaction** | |
| 63 | Define the term interaction and classify it with suitable example. | 08 |
| 64 | Write a short note on Indian traditional drug “Garlic” including its side effects and interaction on human physiology. | 12 |
| 65 | Explain the side effects and interaction of following drugs<br>a) Ginko biloba<br>b) Hypercium | 16 |

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| | c) Ginger<br>d) Ephedra | |
| 66 | Write a short note containing biological source, side effect and interaction of Kava-kava. | 12 |
| 67 | Classify the term herbal drug interaction in detail with examples. | 08 |
| 68 | Write a short note containing biological source, side effect and interaction of Kava-kava. | 12 |
| 69 | Write a short note containing biological source, side effect and interaction of Hypercium. | 12 |
| 70 | Write a short note containing biological source, side effect and interaction of Ginkgo biloba. | 12 |
| 71 | Write a short note containing biological source, side effect and interaction of Ginseng. | 12 |
| 72 | Write a short note containing biological source, side effect and interaction of Garlic. | 12 |
| 73 | Write a short note containing biological source, side effect and interaction of Ginger. | 12 |
| 74 | Write a short note containing biological source, side effect and interaction of Ephedra. | 12 |
| 75 | Give biological source, chemical nature, pharmacological uses, side effect and possible interaction of Lehsun. | 12 |
| 76 | Write a note on bioflavone Gingko with their possible side effects and interactions. | 12 |
| 77 | Define the term interaction and classify it. Give possible side effects and interaction of Ginseng. | 12 |
| 78 | Define the term interaction and classify it. Give possible side effects and interaction of Ginger. | 12 |
| 79 | Define the term interaction and classify it. Give possible side effects and interaction of Gingko biloba. | 12 |
| 80 | Write a short note on herbal drug interaction. | 12 |
| 81 | Give importance of study on drug interaction with suitable examples. | 12 |
| | **7. Standardizations of Herbal Drug** | |
| 82 | Define the term standardization. How will you study the quality standards of herbal formulation? Enlist and explain the parameters. | 16 |
| 83 | Discuss the role of standardization in herbal formulation. | 08 |
| 84 | Define the term Standardization. Enlist and explain the WHO guideline parameters for quality standard of herbal formulation. | 16 |
| 85 | Write in short about standardization of compound drug formulation. | 10 |
| 86 | Discuss in brief about single drug formulation. | 08 |
| 87 | Define the term standardisation. Enlist all the WHO parameters and elaborate any three of it. | 12 |
| 88 | Give the importance of standardization. | 06 |
| 89 | Write a short note on problems involved in standardisation. | 06 |
| 90 | Write a short note on the estimation parameters of standardization. | 12 |
| 91 | Define standardization. Give importance and problems involved in standardization. | 08 |
| 92 | Draw a flow chart of compound drug formulation. | 08 |
| 93 | Elaborate the role of morphological evaluation in the standardization. | 08 |
| 94 | What do you understand by the term validation? Write a short note on the validation of herbal products. | 08 |
| 95 | What do you understand by the term herbal drug? Justify how it can be validate with standardization. | 08 |
| 96 | Explain in brief about WHO guideline for the quality standard of herbal formulation. | 08 |
| 97 | Differentiate between Alkaloid and Flavonoid. | 08 |
| 98 | Differentiate between Extraction and Isolation. | 08 |
| 99 | Write a short note on Tea. | 08 |
| 100 | Discuss the role of Chromatography in the advance Pharmacognosy. | 10 |

**Subject: INDUSTRIAL PHARMACY (BP-706)**

| Ques. No. | Contents | Marks |
|---|---|---|
| 01 | Explain pilot plant scale up for solid dosage form. | 16 |
| 02 | Explain pilot plant scale up for raw materials with pilot plant scale up study significanc | 16 |
| 03 | Explain pilot plant scale up study of requirement, preparation of master procedures. | 16 |
| 04 | Give detail about pilot plant scale up for injections and semisolids. | 16 |
| 05 | Explain brief about Pelletization techniques. | 16 |
| 06 | Give detail about preparation of pellets by extrusion/spheronization method. | 16 |
| 07 | Define pellets and explain centrifugal fluid bed method. | 16 |
| 08 | Explain formulation aspect of pellets. | 16 |
| 09 | Define aerosols and give detail about principle, component of aerosol package. | 16 |
| 10 | Define aerosols and give detail about container, valve and actuators. | 16 |
| 11 | Explain formulation and different type of system of aerosols | 16 |
| 12 | Explain temper resistance packaging in detail. | 16 |
| 13 | Give manufacturing of aerosols and testing of pharmaceuticals aerosols. | 16 |
| 14 | Define pilot plant and explain pilot plant scale up for tablet. | 16 |
| 15 | Define GMP. Explain organization and personnel requirement for GMP. | 16 |
| 16 | Explain facilities for GMP of Product and process control | 16 |
| 17 | Explain facilities for GMP of Building facilities | 16 |
| 18 | Explain industrial hazards due to fire and chemicals with its safety management | 10 |
| 19 | Explain industrial hazards due to mechanical equipment with its safety | 10 |
| 20 | Define pellets detailed about evolution test for pellets. | 16 |
| 21 | Define optimization techniques with its objective. Describe any two method of optimization. | 16 |
| 22 | Describes optimization parameters with examples. | 10 |
| 23 | Enlist the method of optimization. Describe any two methods. | 10 |
| 24 | What is factorial design? Give detail about full factorial design. | 10 |
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| | **[Questions carry 8 marks]** | |
| 25 | Explain formulation aspect of pellets. | |
| 26 | Give evaluation pellets | |
| 27 | Explain pilot plant scale up for ointments | |
| 28 | Explain pilot plant scale up for ophthalmic product. | |
| 29 | Define aerosols, give its advantages and explain its principle. | |
| 30 | Explain propellant and containers for aerosols. | |
| 31 | Explain search method and Packette and Burran method of optimization. | |
| 32 | Explain blister strip packaging. | |
| 33 | Explain simplex method and lagrangian method of optimization. | |
| 34 | Explain plastic container and closure as a packaging material. | |
| 35 | Explain evalution of pharmaceutical packaging material. | |
| 36 | Explain plastic container as a packaging material | |
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| | **[Questions carry 4 marks]** | |
| 37 | Define pellets, pelletization, give advantages and disadvantages of pelletization techniques. | |
| 38 | Draw and explain extruder and sermonizer used in pelletization. | |
| 39 | Explain properties of pellets. | |
| 40 | Explain steps and equipments involved in extrusion. | |
| 41 | Explain industrial hazard due to mechanical equipment and its safety management. | |

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|---|---|---|
| 42 | Define GMP; explain organizational and personal requirements for GMP. | |
| 43 | Give building facilities for GMP. | |
| 44 | Define the term aerosol. | 01 |
| 45 | Define the term optimization. | 01 |
| 46 | Define the term pilot plant. | 01 |
| 47 | Define the term factor. | 01 |
| 48 | Define the term level. | 01 |
| 49 | Define the term GMP. | 01 |
| 50 | Define the term pellets. | 01 |
| 51 | Detail about the regulatory objective of cGMP. | 08 |
| 52 | Describe formulation aspects of pellets. | 06 |
| 53 | Describe in detail mechanical properties of pellets. | 06 |
| 54 | Detail about concept of optimization. | 08 |
| 55 | Merits of plastic container. | 04 |
| 56 | Demerits of plastic container. | 04 |
| 57 | Merits of glass container. | 04 |
| 58 | Merits of metal container. | 04 |
| 59 | Merits of paper container. | 04 |
| 60 | Demerits of glass container. | 04 |
| 61 | Demerits of metal container. | 04 |
| 62 | Demerits of paper container. | 04 |
| 63 | Suggested the plastic is best used for pharmaceutical container. | 06 |
| 64 | Detail about the closure. | 06 |
| 65 | Describe closures with example and mention the diagram. | 06 |
| 66 | Describe about blister and strip packaging. | 06 |
| 67 | Describe about production and process control in GMP. | 08 |
| 68 | Describe desirable characteristics for suitable packaging. | 06 |
| 69 | What about role of documentation in cGMP ? | 06 |
| 70 | Detail about the packaging and labeling control. | 06 |
| 71 | Write note on evaluation of rubber container. | 04 |
| 72 | Write note on evaluation of glass container. | 04 |
| 73 | Write note on evaluation of paper container. | 04 |
| 74 | Write note on evaluation of metal container. | 04 |
| 75 | Difference between primary and secondary packaging. | 04 |
| 76 | Detail about the propellant types. | 08 |
| 77 | Describe stability testing of aerosols. | 08 |
| 78 | Write the significance of pilot plant study. | 06 |
| 79 | Short note on tablets granulation process variables. | 06 |
| 80 | Write the procedures for accurate weighing process of raw material in pilot plant. | 06 |
| 81 | Draw structure of fluid bed pelletization equipments. | 04 |
| 82 | Write note on properties of pellets. | 06 |
| 83 | Short note on the extended release type of pellets. | 04 |
| 84 | Give ideal condition for manufacturing extended release type of pellets. | 08 |
| 85 | Detail about quality control of pellets. | 08 |
| 86 | Draw structure of different type of containers. | 08 |
| 87 | Draw structure of different type of closures | 08 |
| 88 | Enlist different type of largely used containers at presently in pharma industries. | 04 |
| 89 | Enlist different type of largely used closures at presently in pharma industries. | 04 |
| 90 | Describe type of fires. | 06 |
| 91 | Describe about the schematic procedure for stop fire in pharma industries. | 06 |
| 92 | Enlist the equipment take play role in mechanical hazards in pharma industries. | 04 |
| 93 | Describe about the schematic procedure for mechanical hazards in pharma industries. | 06 |
| 94 | Describe about the schematic procedure for chemicals hazards in pharma industries. | 06 |

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| 95 | Describe about the schematic procedure for electricals hazards in pharma industries. | 06 |
| 96 | Describe about the schematic procedure for accidents hazards in pharma industries. | 06 |
| 97 | Detail about safety measures in pharma industries. | 08 |
| 98 | Detail about committee working for safety measures. | 08 |
| 99 | Draw structure of typical aerosols container. | 04 |
| 100 | Enlist the parameter of evaluation of aerosols. | 06 |
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