



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

QUESTION BANK

B Pharmacy

Semester-III

Pharmaceutical Organic Chemistry-2

UNIT 1: BENZENE AND ITS DERIVATIVES

LONG ESSAYS 10 MARKS

1. Define activating and deactivating groups with examples. Discuss the Mechanism of Nitration and sulphonation of benzene.
2. Explain the mechanism of halogenation of benzene. Halogens are deactivating Group but ortho & para director. Give reasons.
3. Define the term ‘electrophilic aromatic substitution reaction’. Discuss the Effect of substituent’s on reactivity. Explain the mechanism of Friedel- Craft’s Alkylation with their limitations.
4. What is electrophilic aromatic substitution reaction? Classify substituent groups with examples, Explain the mechanism of Friedel-Craft’s acylation.
5. What is Electrophilic aromatic substitution reaction? Discuss the mechanism of Nitration and halogenations of benzene.
6. Give the general mechanism of electrophilic aromatic substitution reaction with suitable example. Discuss the orientation effect of i) Hydroxyl group in phenol ii) Nitro group in benzene.

SHORT ESSAYS 05 MARKS

1. Explain the reaction and mechanism of friedel craft’s alkylation with its Limitations.
2. Explain the reaction and mechanism of halogenation of benzene
3. Explain the reaction and mechanism of nitration of benzene.
4. Explain the mechanism of Friedel-Craft’s acylation.
5. Discuss the orientation effect of Hydroxyl and amino group in benzene.
6. Explain the mechanism of Friedel-Craft’s acylation
7. Explain why Halogens are deactivating but ortho para directions towards Electrophilic substitutions.
8. Explain the reaction and mechanism of nitration of benzene.
9. Define activating and deactivating groups with examples. Discuss the Mechanism of sulphonation of benzene.

10. Explain the aromaticity, orbital picture and resonance structure of benzene.
11. Define friedel craft's alkylation. Explain the reaction and mechanism.
12. Explain aromaticity and resonance of benzene.

SHORT ANSWERS 02 MARKS

1. Define the terms 'aromaticity' and 'resonance'.
2. Define electrophiles? Give two examples for electrophiles.
3. Define activating group? Give examples.
4. Define deactivating group? Give examples.
5. What are ortho para directing groups? Give examples.
6. Explain Huckel's rule of aromaticity
7. Write the structure of DDT and BHC. List one use each of DDT and BHC.
8. Write the structure and uses of DDT and chloramine

UNIT-2: PHENOLS, AROMATIC AMINES AND AROMATIC ACIDS

LONG ESSAYS 10 MARKS

1. What are phenols? Give any three methods of preparation of phenol. Write a note on acidity of phenol.
2. What are aromatic amines? Give any three methods of preparation of aromatic amines. Write a note on basicity of aromatic amines.
3. What are phenols? Explain the effect of reactions of phenol. Discuss the effect of substituent's on acidity of phenol.
4. What are aromatic amines? Explain the effect of reactions of aromatic amines. Discuss the effect of substituent's on basicity aromatic amines.
5. What are aromatic acids? Give any three chemical reactions of benzoic acid. Write a note on substituents on acidity of aromatic acids.
6. A) What are phenols? Explain acidity of phenols
B) What are aromatic amines. Explain basicity of aromatic amines.

SHORT ESSAYS 05 MARKS

1. What is acidity discuss the effect of substituent on acidity of aromatic acids
2. What is basicity explain the basicity of aromatic amines tendency of a
3. What are phenols Explain acidity of phenols
4. Give three methods of preparation and three chemical reactions of Aromatic acids
5. Write any three methods of preparation of aromatic amines. Give synthetic uses of aryl diazonium salts.
6. Define aromatic acid? Give four chemical reactions of benzoic acid
7. Give the structure and uses of a) phenol b) o-cresol e) resorcinol d) a-naphthol
e) β -naphthol
8. Define acidity explains the effects of substituents on acidity of aromatic acids.
9. What are phenols? Discuss the acidity of phenols
10. What are aromatic amines? Explain the basicity aromatic amines.
11. Give any two methods of preparation and chemical reactions of aromatic acid.
12. Give any two methods of synthesis of phenols. (Discuss the qualitative test of phenol)

SHORT ANSWERS 02 MARKS

1. Give the structure and uses of phenol and o-cresol
2. Give synthetic uses of aryl diazonium salts
3. Give the structure and uses of α -naphthol and resorcinol
4. Give any two chemical reactions of benzoic acid
5. Give the structure and uses of m-cresol and β -naphthol
6. Give qualitative test of phenol.

UNIT 3: FATS AND OIL

LONG ESSAYS 10 MARKS

1. What are oils & fats? Give the classification of oils with examples. Enlist the analytical of fats and oils with their significance.
2. Enlist analytical constants of oils and fats. Discuss in detail about acid value And iodine value and give their significance.
3. Explain drying, semidrying and non-drying oils with examples. Define Iodine value. Give the principle involved in the determination of Iodine value (any one method)
4. Explain drying, semidrying and non-drying oils with examples. Define acid value. Give the principle involved in the determination of acid value (any one method)
5. Explain drying, semidrying and non-drying oils with examples. Define Saponification value. Give the principle involved in the determination of Saponification value (any one method).
6. What are fatty acids? Explain significance and reactions of hydrolysis, hydrogenation, rancidity and drying of oils.

SHORT ESSAYS 05 MARKS

1. Describe any one method to determine Reichert Meissl (RM) value with its significance
2. Describe any one method to determine Acetyl value with its significance
3. Explain the Saponification and Rancidity of oils and their significance.
4. Explain significance and reactions of hydrolysis and hydrogenation of oils and fats
5. Describe any one method to determine iodine value with its significance
6. Describe any one method to determine acid value with its significance

SHORT ANSWERS 02 MARKS

1. What are fatty acids? Give an example for saturated fatty acids.
2. Give the pharmaceutical applications of fats and oils.
3. Why oils are liquid and fats are solids at room temperature
4. Define saponification value. Give its significance
5. What do mean by Reichert Meissl (RM) value? Give its significance.

6. Define rancidity and drying of oils
7. Define acid value. Give its significance.
8. Define acetyl value. Give its significance
9. Classify fats and oils with examples.
10. Define iodine value. Give its significance
11. What are fatty acids? Give an example for unsaturated fatty acids.
12. Write the pharmaceutical applications of fats and oils
13. Write the significance of hydrogenation of fats and oils
14. Define rancidity? Give its significance
15. Give the compositions of fats and oils.
16. Define saponification value. Give its significance.
17. Define iodine value. Give its significance
18. Give the sources of fats and oils.

UNIT 4: POLY NUCLEAR HYDROCARBONS

SHORT ESSAYS 05 MARKS

1. Outline the synthesis of Anthracene by Haworth's method.
2. Outline the synthesis of Naphthalene by Haworth's method.
3. Define and classify polynuclear hydrocarbons. Give four chemical reactions of Anthracene
4. Define and classify polynuclear hydrocarbons. Give four chemical reactions of naphthalene.
5. Define and classify polynuclear hydrocarbons. Give four chemical reactions of Phenanthrene.
6. Define poly nuclear hydrocarbons Give any two synthesis of anthracene.
7. Define poly nuclear hydrocarbons Give any two methods of synthesis of Phenanthrene.
8. Define poly nuclear hydrocarbons Give any two synthesis of naphthalene.
9. Write the any two synthesis and reactions of phenanthrene.
10. Write the any two synthesis and reactions of anthracene.
11. Write the synthesis of anthracene and phenanthrene.
12. Write the structure and medicinal uses of naphthalene, anthracene, Diphenylmethane and phenanthrene.

SHORT ANSWERS 02 MARKS

1. Write the structure and medicinal uses of diphenylmethane
2. Write any two reactions of phenanthrene.
3. Write any two reactions of Anthracene
4. Write the structure and medicinal uses of phenanthrene derivatives.
5. Write the structure and medicinal uses of triphenylmethane.
6. Write any two reactions of phenanthrene
7. Give the nitration reaction of naphthalene
8. Give the nitration reaction of anthracene
9. Give the halogenation reaction of naphthalene
10. Give them any one synthesis of naphthalene
11. Give the structure and uses of one medicinally important phenanthrene derivatives.
12. Define and classify poly nuclear hydrocarbons.

UNIT 5: CYCLOALKANES

SHORT ESSAYS 05 MARKS

1. Discuss the stability of cycloalkanes.
2. Explain Sachtler-Mohr theory and molecular orbital concept of cycloalkanes.
3. What are cycloalkanes? Write any four methods of preparation
4. Explain Bayer's strain theory of cycloalkanes. What are its limitations?
5. Write the any two methods of synthesis of cyclobutane and cyclopropane
6. Give them any four chemical reactions of cyclopropane
7. Give them any four chemical reactions of cyclobutane
8. Discuss Coulson and Moffitt modifications of Bayer's strain theory of cycloalkanes
9. Define angle strain? Discuss why higher cycloalkanes are more stable than lower members
10. Give any four methods of synthesis of cycloalkanes.
11. Explain ring opening reactions of cyclopropane.
12. Describe Bayer's strain theory. What are its limitations

SHORT ANSWERS 02 MARKS

1. Define cycloalkane give two examples
2. Define angle strain and tetrahedral angle.
3. Give the reactions of cyclobutane
4. What are Coulson and Moffitt modifications compound
5. Write preparation of cyclohexane from aromatic compound
6. How do you calculate the angle in cyclobutane
7. Write Wurtz's synthesis of cycloalkane.
8. Why lower cycloalkanes are unstable than higher cycloalkane give reason
9. Give addition reactions of cyclopropanes
10. What is Sachtler-Mohr's theory
11. How do you calculate the angle in cyclopropane
12. How do you synthesize cycloalkanes from aromatic compounds

Physical Pharmaceutics-1

LONG ESSAY 10 MARKS

1. Define solubility. Explain the various factors affecting solubility of solids in liquids.
2. Define and derive Raoult's law. Write its applications
3. Explain in detail about the different factors affecting the solubility of drugs
4. Define azeotropic mixtures. With the help of neat diagram explain in detail fractional distillation process
5. Describe the method of determining solubility of solids in liquids
6. Define dissolution. Explain the different quantitative factors influencing solubility of drugs.
7. List out physical properties of drug molecules. Describe any two of them with suitable example.
8. Describe the principle, construction and working of Abbe's refractometer. Write anoteon its application.
9. Discuss dielectric constant and dipole movement with their applications in Pharmacy
10. Define optical rotation. Discuss in detail working of polarimeter.
11. Define dipole moment. Explain in detail its method of determination.
12. Write the different methods for the determination of surface tension.
13. Define Surface tension. Explain the principle involved in determination of surface tension by capillary rise method. Give its limitations.
14. Define Adsorption isotherm. Explain Freundlich and Langmuir adsorption Isotherms
15. Define Adsorption isotherms. Explain the behavior of various types of adsorption isotherms with example.
16. Define and classify amphiphiles. Explain the mechanistic role of amphiphiles in Pharmacy.

SHORT ESSAY 05 MARKS

1. Explain solubility of partially soluble Liquid system with example.
2. Explain sublimation critical point
3. Explain Critical solution temperature and mention their applications
4. Explain real solutions with examples
5. What are paratonic solutions? What are the effects of injecting paratonic solutions
6. Explain the various applications of distribution law in Pharmacy.
7. Explain the method for determination of CST.

8. Explain various ideal solubility parameters for solubility process..
9. Discuss the different types of dissolution apparatus.
10. State and explain Nernst Distribution law along with its limitations
11. What are azeotropic mixtures ? Explain with an example
12. Write a note on fractional distillation.
13. What are eutectic mixtures? Explain with examples.
14. Explain sublimation critical point
15. Explain the determination of refractive index by Abbey's refractometer
16. Define dielectric constant .Write a note on its application in Pharmacy
17. Explain in detail different states of matter with examples.
18. Discuss in detail changes in states of matter.Give the principle and working of Dunouy's tensiometer.
19. Explain Freundlich and BET equation with examples.
20. Explain contact angle and its applications in pharmacy.
21. Define HLB and explain Griffins scale.
22. Explain different methods to determine HLB of a surfactant.
23. Explain in detail spreading coefficient with relevant equations.
24. Explain the phenomena of wetting and detergency.
25. Explain the formation of soluble monolayer of an amphiphile.
26. Explain the electrical double layer of an interface.Define complex. Classify with example.
27. Explain metal complexes with example.
28. Explain organic molecular complexes with example.
29. Explain inclusion complexes with example.
30. Explain mechanism of formation of hexamine cobalt chloride ligand complex.
31. Explain the mechanism of cyclodextrin drug inclusion complex. Give its applications
32. Explain the various application of complexation in pharmacy with examples.
33. Enumerate different methods of analysis of complex. Explain continuous variation method of analysis.
34. Enumerate different methods of analysis of complex. Explain solubility method of analysis.
35. Enumerate different methods of analysis of complex. Explain distribution method of analysis.

36. Enumerate different methods of analysis of complex. Explain pH titration method of analysis.
37. Explain Werner's postulates with the help of a suitable example. Discussion the reason for adjusting pH of a dosage form
38. What you mean by buffer capacity and buffer equation
39. Define a buffer. Explain the mechanism of action of buffers
40. Write a note on method of determination of pH.
41. Define pH. Deduce buffer equation for weak acid and its salt with a strong base.
42. Applications of buffers in pharmaceutical and biological system.
43. Write the calorimetric method of determination of pH.
44. Write a note on buffer action and buffer capacity.
45. Discuss the significance of buffers in preparation of isotonic solutions.
46. Write the pharmaceutical applications of buffers.

SHORT ANSWERS 02MARKS

1. Define Diffusion and Dissolution
2. Define vapour pressure law.
3. Liquefaction of gases
4. Define the term isotonicity with an example.
5. Differentiate between isotonic and iso-osmotic solutions.
6. Limitations of Raoult's
7. Define Relative humidity
8. Define latent heat
9. Define vapour pressure
10. Define normality and molarity of solution
11. What you mean by polarization
12. Liquefaction of gases.
13. What do you mean by glassy states?
14. What are aerosols?
15. Refractive Index and its application
16. Define polymorphism with example.
17. Define Surface tension and interfacial tension.

18. Enumerate methods to determine Surface tension.
19. Enumerate methods to determine Interfacial tension
20. Give BET equation
21. Define adsorption isotherm.
22. Define Contact angle
23. Define HLB and mention any two applications
24. Define Spreading coefficient
25. Relate contact angle with miscibility
26. Define amphiphile
27. Define CMC
28. What are micelles? Give its structure
29. Give Gibb's adsorption equation
30. Define Nernst Potential
31. Define Zeta potential.
32. List out wetting agents. Describe any one method for determination of wetting
33. Explain the concept of surface tension
34. What is meant by surface excess? Write its applications in pharmacy
35. Classify surfactants based on its applications
36. Define positive adsorption. Give two examples
37. Enumerate applications of amphiphiles in pharmacy
38. What are complexes? Give examples.
39. Write importance of complexation in pharmacy.
40. Two applications of inclusion complexes.
41. What is chelating agent? Give its uses.
42. What are clathrates?
43. Enumerate different methods of analysis of complex.
44. What are channel type complex? Give example
45. What are Quinhydrone complex? Give example
46. What are Inclusion complex? Give example
47. What are Picric acid complex? Give example
48. Explain the principle involved in the method of pH titration in complexation analysis.
49. Give any four examples of pharmaceutical buffers
50. Explain Sorensen's pH scale

51. What are buffered isotonic solutions
52. Give the buffer equation for an acid and base
53. What are Hypotonic Solutions. Give examples
54. Give the buffer equation for an acid and base
55. Types of pH determination methods
56. Isotonic and paratonic solutions
57. Give Henderson-Hasselbatch equation
58. What are paratonic solutions? What are the effects of injecting paratonic solutions?
59. Explain Griffins scale in detail.
60. Define the term isotonicity with an example
61. Explain buffer equation.
62. Write any two applications of buffers in pharmacy.
63. Write any four examples of pharmaceutical buffers.
64. Write any two applications of buffered isotonic solutions.
65. Write the principle involved in the method of pH titration in complexation analysis.
66. Write any four applications of buffers in biological systems
67. What are buffered isotonic solutions?
68. What are the effects of injecting hypotonic solutions?



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

Pharmaceutical Microbiology

UNIT 1

LONG ESSAYS 10 MARKS

- 1) Classify bacteria on the basis of nutritional requirements and add a note on raw materials used for Preparation of culture media.
- 2) Define and classify culture media. Mention salient feature of each media along with an example.
- 3) Draw an ultra structure of typical bacteria. Write composition and functions of its organelles.
- 4) Classify bacteria on the basis of morphological features. Add a note on composition and functions of Cell wall.
- 5) Differentiate between gram positive and Gram negative cell wall. Add a note on principle and Procedure of Gram's staining technique.
- 6) Describe bacterial growth curve. Add a note on physical factors affecting growth of bacteria.
- 7) Mention methods used for identification of bacteria. Explain any four biochemical tests used for Identification of bacteria.
- 8) What is pure culture? Enlist methods for isolation of pure culture? Describe any two industrially techniques of preserving bacteria.
- 9) Write about importance of microbial preservation technique. Write procedure, merit and demerit of any Four preservation techniques.
- 10) What is pure culture? Write in detail about isolation of pure culture.

SHORT ESSAYS 05 MARKS

- 1) Write a note on raw materials used for preparation of culture media.
- 2) Define and classify culture media with examples.
- 3) Classify bacteria on the basis of morphological features.
- 4) Differentiate between gram positive and Gram negative cell wall.
- 5) Write principle and procedure of Gram's staining technique.

- 6) Write principle and procedure of Acid-fast staining.
- 7) Describe bacterial growth curve.
- 8) Explain IMVIC tests used for identification of bacteria.
- 9) Explain MR-VP tests used for identification of bacteria.
- 10) Write a note on cultivation of anaerobic bacteria.
- 11) Write about methods for maintenance of pure culture.
- 12) Write about importance of microbial preservation technique.
- 13) Differentiate between prokaryotes and Eukaryotes
- 14) Outline working of TEM and SEM
- 15) Give the principle and main characteristic of phase contrast microscopy
- 16) Explain the principle of Electron microscope.

SHORT ANSWERS 02 MARKS

- 1) Differentiate between flagella and fimbriae.
- 2) Differentiate between enrichment and selective media.
- 3) Differentiate between log phase and decline phase.
- 4) Differentiate between acid fast and non acid fast bacteria.
- 5) Differentiate between bacteria and virus.
- 6) Differentiate between fungi and bacteria.
- 7) Mention reagents used for acid fast staining.
- 8) Mention role of each chemical used in gram's staining.
- 9) What is basal media? Give example.
- 10) What is enriched media? Give example.
- 11) What is differential media? Give example.
- 12) What is the role of agar in culture media.
- 13) What is selective media? Give example.
- 14) What is pour plate method, write its uses.
- 15) Mention arrangement based classification of cocci.
- 16) What is lag phase of growth.



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

- 17) What is log phase of growth.
- 18) What is stationary phase of growth.
- 19) What is decline phase of growth.
- 20) List out the different phases of growth of bacteria
- 21) Write contributions of Antony Van Leeuwenhoek.
- 22) Write contributions of Edward Jenner.
- 23) Write contributions of Robert Koch.
- 24) Write contributions of Louis Pasteur.
- 25) Write contributions of Alexander Fleming.
- 26) Write four pharmaceutical uses of microorganisms.
- 27) State Koch's postulates.

UNIT 2

LONG ESSAYS 10 MARKS

- 1) Explain the principle, procedure, applications and demerits of sterilization using autoclave
- 2) Explain the principle, procedure, applications and demerits of sterilization using hot air oven
- 3) Explain the mechanism of action, procedure, applications and factors affecting sterilization using ethylene oxide.
- 4) Explain the source, mechanism of sterilisation, merit, demerits and applications of sterilization using radiations.
- 5) Explain principles involved in sterilisation by filtration. Add a note on its merits and demerits

SHORT ESSAYS 05 MARKS

- 1) Explain the mechanism of sterilization and heat transfer by hot air oven.
- 2) Explain the principle involved in autoclaving.
- 3) Write the procedure, merits and demerits of membrane filtration
- 4) Write the procedure, merits and demerits of ethylene oxide sterilization
- 5) Explain the factors affecting gaseous sterilization
- 6) Mention indicators used for various sterilization methods
- 7) Write the production, mechanism of action, demerits and applications of UV radiations.
- 8) Explain MR-VP tests used for identification of bacteria.
- 9) Write the significance of various reagents used in Gram staining and Acid fast staining
- 10) Write principle and procedure of Gram staining.
- 11) Write principle and procedure of acid-fast staining.
- 12) Explain IMVIC tests used for identification of bacteria.
- 13) Describe any two methods of viability counting.



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

SHORT ANSWERS 02 MARKS

- 1) Mention the demerits of ethylene oxide sterilization
- 2) Write bio-indicators for thermal sterilization.
- 3) Write applications of uv radiations.
- 4) What is Pasteurization? Mention methods
- 5) Define sterilization
- 6) Classify physical method of sterilization
- 7) Explain the advantages of autoclaving over hot air sterilization.
- 8) List out any four applications of Gamma irradiation.
- 9) Mention any four applications of autoclave.
- 10) Mention any four applications of dry heat sterilization.
- 11) Mention any four applications of gaseous sterilization.
- 12) Mention any four applications of ethylene oxide sterilization
- 13) Mention any four applications of filtration sterilization.

UNIT 3

LONG ESSAYS 10 MARKS

- 1) Classify disinfectants. Write the mechanism of action and uses of phenolic disinfectants.
- 2) Explain different factors affecting disinfection.
- 3) Explain different methods for evaluation of bacteriostatic disinfectant
- 4) Discuss in detail about Redial Walker's test.
- 5) Enlist various methods of evaluation of bacteriostatic and bactericidal disinfectant. Explain any Method of bacteriostatic disinfectant.
- 6) Write classification, mechanism of action and uses of phenolic and aldehyde disinfectants.

SHORT ESSAYS 05 MARKS

- 1) Write a note on cultivation of virus.
- 2) Discuss about merits and demerits of viral cultivation techniques.
- 3) Describe steps involved in replication of virus.
- 4) Write about classification of virus.

SHORT ANSWERS 02 MARKS

- 1) Mention media for cultivation of fungi
- 2) Mention pharmaceutical uses of fungi.
- 3) Write structure of typical virion.
- 4) What is mycelium?
- 5) Why are virus described as obligate parasites?
- 6) Give examples for disinfectants with viricidal activity
- 7) Give two examples for alcoholic disinfectants.
- 8) Differentiate between disinfection and antiseptis.
- 9) Write the ideal properties of disinfectant
- 10) Define disinfection.
- 11) Mention the factors affecting disinfectant activity
- 12) Difference between bacteriostatic and bactericidal agents.



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

- 13) What is direct inoculation method?
- 14) Write the significance of positive control in sterility testing.
- 15) What is direct inoculation method of sterility testing?
- 16) Write the principle of sterility testing.
- 17) Write the principle of membrane filtration method of sterility testing.

UNIT 4

SHORT ESSAYS 05 MARKS

- 1) Write in detail about the construction and design of aseptic room
- 2) What are the main sources of contamination of an aseptic room? How will you prevent it?
- 3) Describe construction and working of laminar air flow
- 4) Classify clean area according to British standard and US standards
- 5) What are the sources of contamination and their control in aseptic room?
- 6) Describe the general procedure of antibiotic assay
- 7) Write briefly on different methods used for microbiological assay of antibiotics
- 8) Outline the process of assessment of new antibiotic.
- 9) Explain principles involved in microbiological assay of streptomycin
- 10) Explain principles involved in microbiological assay of vitamin B12

SHORT ANSWERS 02 MARKS

- 1) What are Rodac plates?
- 2) What is Grade 100?
- 3) How will you validate the HEPA filter?
- 4) Write note on the Grade B room
- 5) Draw a flow diagram of an aseptic area

UNIT 5

SHORT ESSAYS 05 MARKS

1. Explain different factors affecting microbial spoilage of Pharmaceuticals
2. Define cell culture, give the merits, demerits and application of cell culture
3. Explain the different sources and types of microbial contamination of pharmaceuticals.
4. Write briefly the general procedure for cell culture
5. How will you detect microbial contamination in pharmaceuticals
6. Write briefly on general requirements of cell culture laboratory.
7. What are the methods used for evaluation of microbial stability of formulations?
8. Differentiate between primary and established cell culture
9. Explain the evaluation of microbial stability of formulations.
10. Discuss about advantages and disadvantages of cell culture technology.
11. Explain the preservation of pharmaceutical products using antimicrobial Agents.
12. Write the applications of cell cultures in pharmaceutical industry and research.

SHORT ANSWERS 02 MARKS

1. Mention microorganisms causing spoilage of pharmaceuticals.
2. Write the incubation conditions for cell culture
3. What are the visible changes of microbial contaminations in pharmaceuticals
4. Mention any four major requirements for cell culture laboratory.
5. How do you assess microbial contamination? Mention
6. Mention the media used in cell culture
7. List out different types of microbial contaminants in pharmaceuticals.
8. What is secondary cell culture?
9. List out different types of spoilage in pharmaceuticals
10. What is primary cell culture?
11. List out sources of microbial contaminations in pharmaceuticals
12. What are cell lines?



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

Pharmaceutical Engineering

UNIT-1

Chapter 1: Flow of fluids

1. What is the use of a pitot tube? Write its advantages and disadvantages.
2. Explain the term 'head'. List the different heads in the Bernoulli's Theorem.
3. What is Reynolds number? Describe its importance.
4. List the advantages and disadvantages of rotameter.
5. How are losses of energy due to enlargement in cross section measured? Give relevant equation and explain the terms..
6. Give Reynolds number and explain the symbols used therein.
7. What is pressure head? How it is calculated?
8. Differentiate constant pressure and constant area meters. Give Examples of devices under each category.
9. Why is mercury used as a liquid in manometer?
10. Describe the types of flow patterns exhibited by liquids in motion.
11. Write Bernoulli's equation and explain the symbols used therein with a Labelled diagram.
12. Describe Reynolds experiment to illustrate type of flow.
13. Explain the characteristics of different types of flow. Add a note on Reynolds number.
14. Compare and contrast the advantages and disadvantages of pitot tube and rotameter.
15. What are the merits and demerits of venturi meter over orifice meter?
16. Explain principle and working of simple manometer.
17. Describe relevant equations for calculation of flow rates using orifice Meter.
18. Derive Bernoulli's equation stating the assumptions.
19. Explain the energy losses that occur when a fluid flows through a pipe with relevant equations.
20. Explain the principle and construction of venturimeter.
21. Explain construction and working of differential monometer.

Chapter 2: Size reduction

1. It is essential to include a sieve in the size reduction equipment?
2. In a hammer mill, the particle size of the powders is far less than mesh size of the screen. How is it possible?
3. Why do screen woven sieves give more fine powder than the wire woven sieves?
4. Size reduction of vegetable matter is essential for the extraction of crude drugs. Explain.
5. Why is it difficult to obtain uniform sized product during milling Without the use of sieve?
6. Fluid energy mill is better equipment for size reduction of thermolabile Substances compared to hammer mill. Substantiate.
7. Ball mill is not useful for size reduction of fibrous material. Explain.
8. How is it possible to prevent the heat generated during milling using Colloid mill?
9. Size reduction of a material enhances the action of drugs. Explain. Name one mill each for fibrous material and hard material.
10. Under what condition size reduction is not effective in ball mill?
11. How do you prevent the problems of sticking and clogging of sieves the size reduction equipment?
12. List special precautions to be taken while thermolabile substances are subjected to size reduction process.
13. Why should powder contains fewer amounts of fines when it is meant for percolation process of extraction?
14. What are the advantages of swinging type of hammer compared to rigid Hammers?
15. Powders of same particle size that are obtained by different equipment have same physicochemical characteristics. True or False. Justify.
16. List the areas in which size reduction equipment is used in tablet Production.
17. A large number of size reduction equipment are available currently. Why do we require so many types of mills?
18. Size reduction of powder is not possible, if particle do not contain flaws or cracks. Explain.

19. The classical equipment mortar and pestle uses the mechanism of Impact in size reduction. True or False. Explain.
20. Fluid energy mill is meant for wet grinding. True or False. Explain.
21. Reducing the size of the particles to fines leads to particle aggregation. True or False. Explain.
22. Size reduction mill can also be used as mixing or dispersion equipment. True or False. Explain.
23. How does sickness affect the process of size reduction?
24. How does the presence of moisture interfere with the process of size reduction?
25. Differentiate the mechanisms 'attrition' and 'impact' in for size reduction.
26. Differentiate dry grinding and wet grinding. State Rittinger's law.
27. Describe five factor that influence the selection of milling equipment for size reduction.
28. Explain with the help of a diagram the construction and working of a Ball mill.
29. Explain with the help of diagram the construction and working of a Hammer mill..
30. Describe the mechanism of size reduction with suitable examples of Equipment.
31. What is ultra-fine grinder? Explain the concept of ultra- fine grinding.
32. Describe 'micronizer'. Describe aseptic grinding process of antibiotics.
33. List the laws governing size reduction. What is work index?
34. How is size reduction affected in ultra-fine grinders? Describe the Mechanism.
35. How is energy utilized in size reduction accounted for?
36. Explain the factors related to feed-materials influencing size reduction.
37. Describe the construction, working, advantages and disadvantages of Ultra-fine grinder.
38. Describe the milling equipment with the help of a neat diagram that uses The principle of shear and impact.
39. Explain the theories related to the size reduction of a powder.
40. Explain the advantages and disadvantages of size reduction process.
41. State and explain the laws governing size reduction.
42. Describe the mechanism and modes of size reduction of solid drugs.

Chapter 3 : Size separation

1. Name the standards of screens used in pharmaceutical practice.
2. What are standard sieves?
3. Differentiate ideal and actual screens.
4. Enumerate different modes of size separation.
5. List the specifications and standards for sieves.
6. Explain the term blinding of screen. How is it prevented?
7. What are various grades of coarse powders? Define them.
8. Give the classification of fine powders with definitions.
9. What are advantages of expressing sieves by a sieve number over Nominal size of aperture?
10. Differentiate the terminology, normal size of aperture and nominal Diameter of the wire.
11. What are the uses of screen analysis? How is it expressed?
12. List the methods of sieve analysis used for testing the powders. Give their relative advantages.
13. Enlist various grades of powders official in pharmacopoeia.
14. What is the difference between sedimentation and elutriation?
15. What is the difference between free setting and hindered setting?
16. State the term 'elutriation'. Explain its applications and advantages.
17. What is the difference between static and moving liquid methods Elutriation?
18. Compare the methods of sieving and classification in terms of their Utility.
19. Define sieve number and nominal aperture size.
20. Explain the working of a cyclone separator and its usefulness.
21. Describe the method of size separation using Sieve shaker.
22. Explain various grades of powders official in pharmacopoeia.
23. Give the details about the various standards fixed by the pharmacopoeia For sieves.
24. Describe the specifications of standard sieves as per IP.
25. Explain the concept of settling behaviour using water with a suitable Diagram.

26. Explain the behaviour of slurry setting of thickeners with a suitable Diagram.
27. Define the term 'Elutriation'. Write its applications.
28. Explain the mechanism and applications of Elutriation tank
29. Explain the methods of size separation of particles in a powder using air as a medium.
30. Explain the principles of sedimentation of particles using liquid as a Medium.
31. Explain the specific uses and applications of a scrubber. Draw the Sketch of the equipment.
32. Explain construction and working of bag filter.
33. Explain principle and working of cyclone separator.
34. Describe one industrial method for size separation of a powder and its applications.

Chapter 4 : Mixing

1. Mention the equipment used for solid-solid mixing.
2. List the equipment used for powder mixing in pharmaceutical industry.
3. Explain the working of a mixer used for mixing dry powders before Granulation.
4. Explain the construction and working of a ribbon blender for mixing Solids.
5. Write the uses of the sigma blade blender.
6. Explain the factors influencing mixing of solids. Write the principle of planetary mixer.
7. Describe the equipment for solid-solid mixing of pharmaceutical Materials.
8. Define and differentiate mixing and agitation.
9. Classify liquids based on their miscibility. Give one example in each Case.
10. Enumerate the applications of liquid mixing.
11. Describe the mechanisms of liquid mixing.
12. Enumerate the mechanisms of solids mixing.
13. Explain flow patterns of impellers.
14. What are the factors affecting selection of a mixer?
15. How are pipe mixers advantageous in liquid mixing?
16. What is meant by vortex? How is it prevented?
17. Give the characteristics of mixing impellers.
18. Describe the operation of agitator mixers.
19. Describe the turbine mixer with flow pattern.
20. Suggest a suitable mixer and its operation for mixing of viscous liquids.
21. Draw a neat labelled diagram of mixing tank with accessories for efficient liquid mixing.
22. Describe the principle, working, and advantages of jet mixer.
23. What are flow components for liquids? Explain their role during mixing.
24. Explain the factors influencing mixing of solids.
25. What are the reasons for vortex? What are the drawbacks of vortex? Suggest solutions for the problems of vortex formation.
26. Discuss the devices used for liquid-liquid mixing.



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

27. Suggest suitable mixing equipment for semisolids.
28. List different factors influencing the selection of an emulsifier.
29. The principle, construction, working, advantages, and Disadvantages of a Silverson emulsifier with the help of a neat diagram.
30. Describe the construction and working of the rapisonic homogenizer.
31. Write the principle of a mixer suitable for mixing of solids and Semisolids.
32. With the neat sketch, describe the construction and working of equipment for mixing pastes and plastic masses. What are their pharmaceutical applications?

UNIT-2

Chapter 1 : Evaporation

1. Explain the term Evaporator capacity.
2. Define evaporation in terms of capacity and economy as applied to Evaporation practice.
3. What is calandria? Give its uses.
4. What is calandria? Write its importance.
5. What are the different modes of feed in multiple effect evaporator?
6. What are the criteria in selecting the metals for the construction of steam Jacketed kettle?
7. Write the importance of forced circulation in forced circulation Evaporator.
8. How is multiple effect evaporator advantageous over single effect Evaporator?
9. Elaborate the concept of multiple effect evaporation. What specific advantages does it offer?
10. Explain the construction and working of climbing film evaporator.
11. Describe the construction and working of film evaporator of any one type.
12. Explain the construction and working of a forced circulation evaporator.
13. Explain the construction and working of a horizontal tube evaporator.
14. How does film evaporator function? Elaborate the answer with a neat Sketch of one such evaporator. List the merits, and demerits of film evaporator system.
15. Classify evaporators. Describe principle, construction and working of a Climbing film evaporator.
16. Explain the term ‘multiple effect evaporation’ and ‘evaporator Capacity. How can many effects go into a multiple effect evaporator?
17. What do you understand by multiple effect evaporator’? Describe one, Such evaporator. How do you feed such evaporator?
18. Classify evaporators. Describe principle and working of multiple effect Evaporator.

Chapter 2: Heat transfer

1. Describe the types of condensation for saturated vapour free from non condensable gases.
2. Define Black body and Grey body.
3. Give characteristics of drop wise and film types condensation.
4. Drop wise or film type condensation gives superior value of Overall heat Transfer co-efficient and why?
5. List the characteristics of heat transfer by radiation.
6. What are 'Grey bodies'? How do they radiate heat?
7. Give the final equation for heat transfer by conduction through Resistances in series and explain the terms.
8. What are overall heat transfer co-efficient and individual film Coefficient?
9. Differentiate between film coefficient and overall heat transfer Coefficient.
10. What is surface coefficient? Write its importance.
11. What are overall heat transfer coefficient' and individual heat transfer coefficients?
12. Define conductivity with a suitable example.
13. State and explain Stefan Boltzmann's law of heat of radiation.
14. State and explain Fourier's law of heat transmission with equation.
15. Explain "Nucleate boiling" and 'Film boiling'.
16. Define radiation. Explain Stefan Boltzmann's Law.
17. Write the final equation for heat transfer by conduction through resistance in parallel and explain the terms.
18. Differentiate Log mean radius and arithmetic Mean radius in conduction of heat. What are its applications?
19. What is mean by overall heat transfer coefficient? What is its significance.
20. Differentiate heat interchanger and heat exchanger.
21. Write the differences between steam trap and drainage pipe in handling steam effectively.
22. Describe the term 'entrainment'. How is it prevented?

23. Describe the possible reasons for foaming.
24. Describe the advantages and disadvantages of steam boiler.
25. List for characteristics of steam.
26. List the advantages and disadvantages of two each of super heated Steam.
27. Explain the terms 'dry saturated steam' and 'superheated steam'.
28. Explain the role of stagnant film in the flow of heat in liquids.
29. Define 'overall heat transfer coefficient' and 'individual film Coefficient.
30. Write Stefan Boltzman equation. Explain the terms.
31. Compare and contrast heat transmission following counter current and parallel current feed techniques with relevant equations.
32. Derive Fourier's law for the conduction of heat through a metal wall. Mention its applications.
33. Derive an equation for heat transmission through a circular pipe from Fourier's law.
34. Explain the modes of heat flow.
35. Write the construction and working of liquid-liquid heat interchanger.
36. Draw a neat labelled diagram of a shell and tube heat exchanger and explain its construction.
37. Derive on equation for heat transfer by conduction through compound Resistances in series.
38. Explain the working of a heat exchanger with a labelled diagram.
39. Describe finned tube heat exchanger and its specific advantages.
40. Describe the conduction of heat through a circular pipe. Give suitable equations for rate of heat transfer and explain terms
41. Describe the conduction of heat through compound resistances in series.
42. Derive an expression for the logarithmic mean temperature difference.
43. Describe liquid heat interchangers. What are its advantages?
44. Explain the working of any one heat exchanger with a labelled diagram.
45. Explain the construction and working of 'balanced pressure steam Trap'.

46. Describe the construction of a pharmaceutical process vessel with different steam controls.
47. Explain the term 'steam trap' giving a suitable examples.
48. Describe steam as an ideal heating medium.
49. With the help of a neat diagram, explain the concept of film and overall heat transfer in forced convection. Deduce relevant mathematical equations.
50. State Fourier's law. Derive an equation for heat transfer by conduction through a metal wall.
51. Describe the construction, operation, advantages and disadvantages of a Multipass heater.

UNIT-3

Chapter 1: Drying

1. Distinguish drying and evaporation.
2. Give suitable dryers: a) Granular free flowing solids b) Wet bricks before sending to kilns c) Sticky pastes d) Food products like Horlicks.
3. Define critical moisture content and equilibrium moisture constant.
4. Explain the importance of drying in the pharma industry with examples.
5. Define bound water and free moisture content.
6. Mention the factors affecting constant drying rate.
7. What are the applications of FBD?
8. Classify dryers giving suitable examples.
9. Define drying. Give its importance in the manufacture of dosage forms.
10. Explain how are agitator dryers useful to dry pasty and sludgy materials?
11. How do you obtain the rate of drying curve for a given drying operation? Give its applications.
12. Write the mechanism of drying in second falling rate period.
13. Recommend a suitable dryer for drying the following substances and substantiate your answer with at least two reasons: a) Pasty extracts b) Granular solids
14. Describe the drying rate curve for a nonporous granular solid.
15. Describe the principle with the help of a labelled diagram of fluidized bed dryer.
16. List the pharmaceutical applications of freeze drying process. Give salient features of the process.
17. Describe the construction and working of a fluidized bed dryer.
18. Describe the construction and working of a tray dryer.
19. Explain the principle of spray drying with suitable labelled diagram.
20. Describe the drying rate curve.
21. Explain the principle and working of drum dryer.

22. Explain the factors to be considered in the selection of a suitable dryer.
23. Explain the operation and applications of fluidised bed dryer.
24. Describe the function of drum dryer and its uses.
25. Describe the rate of drying curve for a crude fibrous drug.
26. Explain the principle of freeze drying? What are its applications in pharmacy?
27. Compare the operations of spray dryer and tray dryer.
28. Describe the concept of spray dryer. What are its advantages? Compare the spray drying with other methods of drying. Explain the construction and operational details of freeze dryer. Describe its applications in pharmacy.
29. Explain principle, construction and working of freeze dryer.
30. Describe the concept of spray drying. Describe the specific advantages of spray dried product over drum dried material. Also list the pharmaceutical applications.
31. How do you classify dryers? Describe in detail the constant rate and falling rate periods. Add a note on critical moisture content.
32. Discuss the construction, working, advantages and disadvantages of spray dryer.
33. Explain the theory of drying giving more emphasis on rate of drying with suitable graphs.

Chapter 2 : Distillation

1. State Raoult's law.
2. Name the materials commonly used in packing of fractionating columns.
3. Differentiate between plate towers and packed towers.
4. Describe the construction of any one fractionating column.
5. Distinguish evaporation and distillation.
6. Define mean free path with its importance
7. Distinguish between 'stripping section' and 'rectifying section of a rectifying column.
8. What are the characteristics of packing materials used in fractionating columns?
9. Name the different types of rectifying columns.
10. Define distillation. Mention two applications of it as per IP.
11. Differentiate differential distillation and rectification.
12. Define relative volatility and write its significance.
13. Define 'flash distillation'. List applications.
14. What is meant by steam distillation? What are its special advantages?
15. Describe the principle and applications of steam distillation.
16. Describe the construction of bubble cap column. What are its advantages?
17. Describe the bubble cap rectifying column. What are the specific drawbacks of bubble's cap column?
18. Describe one fractionating column of your choice. List its advantages and disadvantages.
19. Describe the construction and working of a distillation apparatus for the preparation of water for injection.
20. Explain the principle and procedure of molecular distillation what are its applications?
21. Distinguish between plate column and packed towers. Describe the types of packing for rectifying columns. How is absolute alcohol made?
22. Explain the principle of fractional distillation and working of fractional distillation unit.
23. Describe fractional distillation. Explain the working of bubble cap column.

UNIT-4

Chapter 1: Filtration

1. List the factors influencing the rate of filtration.
2. Write Kozeny-Carman equation and give its significance.
3. Write the mechanism of filter aids.
4. Give the principle of filtration aids.
5. Differentiate pressure filtration and vacuum filtration.
6. List the properties of filter aids.
7. Distinguish filtration and clarification.
8. What are filter aids? Give two examples.
9. Differentiate surface filtration and depth Filtration.
10. What is meant by the wood sinter? List the uses and advantages of sintered glass filter.
11. What is the mechanism of filtration in membrane filter? What are its Advantages and disadvantages of membrane filters?
12. Give the neat labelled diagram of pressure sand filter. What are its Uses?
13. If the slurry contains 25% solids. What type of filtration equipment Employed? Why?
14. Explain the mechanism by which filter aids improve the rate of filtration.
15. Why coagulants are added to slurry before proceedings for filtration? What is its mechanism for improving the rate of filtration?
16. What are the conditions in which pressure sand filter is used? Why?
17. Explain the method of washing the residue with a suitable example of Filtration equipment.
18. What is meant by back washing? How is it achieved in filtration?
19. Suggest a method of filtration using vacuum. Explain its role in the Filtration.
20. Explain the ideal properties of filter media.
21. Compare the features of filter press and filter leaf.
22. What are the characteristics of filter aids?
23. Explain the mechanism of filtration.

24. What are filter aids? Name the filter aids commonly used in pharmacy Practice.
25. Describe the construction and working of a rotary drum filter.
26. Describe the construction and working of leaf filters.
27. Describe the construction and working of a preferred filter suitable for filtration of high viscous liquids.
28. Describe the construction and working of a Seitz filter.
29. Describe the construction and working of a cartridge filter.
30. Explain any five factors affecting the selection of filtration equipment.
31. Explain the construction and working of filter press.
32. Explain the theories of filtration.
33. Explain the process of washing of the cake in filter press.
34. Explain the construction, working, advantages and disadvantages of filter press.
35. Explain the theories of filtration giving the principle, mechanism and factor affecting the process.
36. With a neat labelled diagram describe the construction and working of a suitable industrial filter for handling of high solid containing slurries.
37. With a neat labelled diagram, describe the construction and working of an industrial filter suitable for clarification of syrups.
38. With neat labelled diagram, describe the construction and working of a chamber press.

Chapter 2 : Centrifugation

1. Write two pharmaceutical applications of centrifugation.
2. What are basket centrifuges? Describe their applications.
3. What are application of basket centrifuges.
4. Write the applications of perforated basket centrifuges.
5. Explain the principle behind centrifugation.
6. What are the factors influencing centrifugal effect?
7. Give the equation for centrifugal effect.
8. What is meant by under-driven filtration type basket centrifuges?
9. Differentiate between sedimentation centrifuges and filtration centrifuges.
10. Name one Example each for sedimentation centrifuge and filtration centrifuges.
11. Classify industrial centrifuges. Write construction and working of a perforated basket centrifuges.
12. Give five pharmaceutical application of centrifugal separations.
13. Describe continuous centrifuges. Giving their advantages.
14. Explain the construction and working of semicontinuous centrifuge.
15. Describe the construction and working of supercentrifuge.
16. Explain the construction and working of a under driven perforated basket centrifuge.
17. Describe the theory of centrifugation.
18. Discuss construction and working of a discontinuous centrifuge for solid separation.
19. Describe the construction and working of centrifuge used for the Separation of slurry containing high percentage of solids.
20. Describe the construction and working of centrifuge used for the separation of two liquid phases as in case of emulsions.

UNIT-5

Chapter 1: Material of construction, corrosion

1. Write the applications of glass as materials of construction in the Pharmaceutical industry.
2. Enumerate the types of glass. Mention an example of formulation that is Stored in each type of container.
3. Write the advantages and disadvantages of plastic as packaging Material.
4. Write the uses of rubber as a packaging material.
5. Explain the process of corrosion on a single metal wall.
6. Explain the importance of stainless steel in Pharmaceutical Industry.
7. Write a note on the utility of glass and stainless steel in Pharmaceutical Industry.
8. Describe steel as a material of plant construction.
9. With neat labelled diagram, describe the construction and working of a chamber press.

Chapter 2 : Centrifugation

1. Write two pharmaceutical applications of centrifugation.
2. What are basket centrifuges? Describe their applications.
3. What are application of basket centrifuges.
4. Write the applications of perforated basket centrifuges.
5. Explain the principle behind centrifugation.
6. What are the factors influencing centrifugal effect?
7. Give the equation for centrifugal effect.
8. What is meant by under-driven filtration type basket centrifuges?
9. Differentiate between sedimentation centrifuges and filtration centrifuges.
10. Name one Example each for sedimentation centrifuge and filtration centrifuges
11. Classify industrial centrifuges. Write construction and working of a perforated basket centrifuges.
12. Give five pharmaceutical application of centrifugal separations.
13. Describe continuous centrifuges. Giving their advantages.
14. Explain the construction and working of semicontinuous centrifuge.
15. Describe the construction and working of supercentrifuge.
16. Explain the construction and working of a under driven perforated basket centrifuge.
17. Describe the theory of centrifugation.
18. Discuss construction and working of a discontinuous centrifuge for solid separation.
19. Describe the construction and working of centrifuge used for the Separation of slurry containing high percentage of solids.
20. Describe the construction and working of centrifuge used for the separation of two liquid phases as in case of emulsions.

21. Name five important classes of plastics. Mention their applications in pharmaceutical industry.
22. Describe the steel alloys used in pharmacy practice.
23. What are the properties of glass? What are its applications as material of construction?
24. Describe various types of iron as materials of construction.
25. Classify the materials of Construction. Explain the uses of ferrous metals.

Chapter 3: Corrosion

1. Explain the terms ‘pitting corrosion’ and ‘galvanic corrosion’
2. Give the applications of protective linings and coatings with respect to Corrosion control with suitable examples.
3. What is the role of plastic washers in the corrosions of metals?
4. How are oxide films formed? What are its advantages?
5. Highlight the role of oxygen in the corrosions of metals.
6. Explain the role of temperature on the metal corrosions.
7. Iron corrodes faster than aluminium, even though iron is placed below Aluminium in the electrochemical series why?
8. Impure metal corrodes faster than pure metal under identical conditions.
9. Differentiate chemical corrosions and electrochemical corrosions.
10. Explain the term ‘rusting of iron’ what is its chemical formula?
11. Describe the term ‘passivity’. How is it combat corrosions?
12. Explain the effect of pH on corrosion.
13. Rusting of iron is quicker in saline water than in ordinary water, why?
14. Describe the effect of grain size of the metal on corrosion.
15. Why are two dissimilar metals not allowed to come in contact with each other?
16. Which type of oxide film is more protective against corrosion? Give one. Example of metal, which produces such an oxide film.

17. How does the addition of amines protect against corrosion of iron?
18. What is corrosion? Mention the factors that influence rate of corrosion.
19. Explain measures you suggest to check the problems of corrosion.
20. Write the electrochemical theory of corrosion.
21. Describe various types of corrosion and suggest the methods to tackle the same in pharmaceutical industries.
22. Describe the biological corrosion and suggest the preventive measures.
23. Describe the mechanism of corrosion of iron.
24. Define corrosion. Give its causes. Classify corrosion.
25. Explain 'galvanic corrosion and pitting'.
26. What is corrosion? Name the various types of corrosion. How can Corrosion be prevented?
27. Describe various types of corrosion and suggest the methods to tackle the same in pharmaceutical industries.

Chapter 4: Material Handling system

1. Why improper handling of materials must be avoided?
2. Enlist the objectives of conveying.
3. List two objectives of conveying of solids.
4. What are the differences between bins and silos?
5. Name the conveyors suitable for transporting solids: a) To a long distance and (b) to elevate large quantity of materials in a Closed condition.
6. What are the objectives for using fluidisation for solids transport?
7. Illustrate the concept of solid transport by fluidisation.
8. Describe the principle of pneumatic conveyor used in pharmaceutical Industry.
9. Describe the different types of conveyors used in pharmaceutical Industry.
10. List of advantages of screw conveyor and screw elevator. How do you compare these with pneumatic transport of solids?



East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

11. Describe the construction and working of a screw conveyor.
12. Write the principle of belt conveyor with a neat labelled diagram. Describe the construction and working of belt conveyor system for solid Transport.
13. Name the devices used for transportation of solids. Describe pneumatic Conveyor.
14. Describe the factors influencing the selection of transportation Equipment for solids.



Vision and Mission of the Institution

Vision

The East Point College of Pharmacy aspires to be a globally acclaimed institution, **recognized for excellence in pharmaceutical education, research and nurturing students for holistic development.**

Mission

- M1** Create pharmacy graduates through **quality education**
- M2** Promote innovation, **creativity**, and excellence **in teaching**, learning, and **research**
- M3** **Inspire** integrity, teamwork, critical thinking, **personal** development, and ethics in **students** and lay **the** foundation for lifelong learning
- M4** **Serve** the **healthcare, technological, scientific, and economic** needs of then **society.**