

Printed Pages – 10

Roll No. :

341351(41)

**B. Pharmacy (Third Semester) Examination,
Nov.-Dec. 2021**

(PCI Scheme)

(Pharmacy Branch)

PHARMACEUTICAL ORGANIC CHEMISTRY-II

[Theory (BP301T)]

Time Allowed : Three hours

Maximum Marks : 75

Note : This question paper contains **three parts 'A', 'B' and (C)**. Part- 'A' contains 20 MCQs of 1 mark each. All questions are compulsory in Part- 'A'. Part- 'B' contains 3 long answer questions of 10 marks each. Attempt any two questions from part 'B'. Part- 'C' contains 9 short answer questions each of 5 marks. Attempt any 7 questions from part 'C'.

Part- 'A'

20×1=20

Note : Attempt all questions. All questions carries 1 mark.

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1. Multiple choice questions :

- (i) Identify the incorrect statement regarding aromaticity :
- (a) It is the extra stability possessed by a molecule
 - (b) p-orbitals must be planar and overlap
 - (c) Cyclic delocalization takes place
 - (d) It does not follow Huckel's rule
- (ii) Select the correct statement regarding the aromatic nitrogen molecule :
- (a) It is not hybridized
 - (b) It is sp hybridized
 - (c) It is sp^2 hybridized
 - (d) It is sp^3 hybridized
- (iii) State the incorrect statement :
- (a) A resonance may sometimes cause sp^3 atoms to become sp^2 hybridized
 - (b) Delocalizing one lone pair causes aromaticity
 - (c) One lone pair will be counted as two pi electrons according to Huckel's equation
 - (d) Two sigma bonds make up a double bond

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- (iv) Which of the following compounds is more acidic?
- (a) C_6H_5OH
 - (b) CH_3CH_2OH
 - (c) H_2O
 - (d) $CH_3CH_2CH_2OH$
- (v) Which of the following statements is incorrect ; aromatic compounds :
- (a) Are planar
 - (b) Have $4n + 2$ π -electrons
 - (c) Are cyclic
 - (d) Are generally less reactive than similarly substituted alkenes
- (vi) Which reducing agent is used for the reduction of nitro compound to phenyl amine?
- (a) $LiAlH_4$
 - (b) Sn/HCl
 - (c) $Na/alcohol$
 - (d) H_2/Ni

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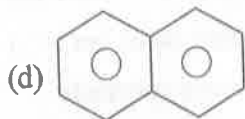
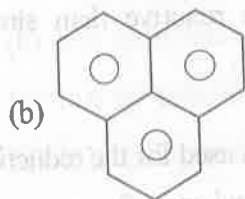
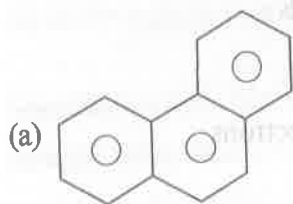
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(vii) The Friedel-Crafts alkylation :

- (a) Works very well for primary chlorides
- (b) Works very well for tertiary chlorides
- (c) Works very well for acyl chlorides
- (d) Works very well without catalyst

(viii) Structure of Phenanthrene



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(ix) Stability of cycloalkane is given by whom :

- (a) Henderson
- (b) Huckel rule
- (c) Baeyer strain theory
- (d) Sachse Mohr

(x) What is application of diazonium salt?

- (a) It is standard reagent used in synthesis of organic chemistry
- (b) It is standard reagent used in synthesis of inorganic chemistry
- (c) Both
- (d) None

(xi) What is Iodine value :

- (a) Number of mg of KOH required to neutralize 5 mg of fat
- (b) Number of gm of KOH required to neutralize 5 mg of fat
- (c) Number of mg of KOH required to neutralize 100 gm of fat
- (d) Number of gm of KOH required to neutralize 5 gm of fat

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(xii) Fatty acid contain :

- (a) - CHO
- (b) - COOH
- (c) - C = O
- (d) CH₂OH

(xiii) DDT is prepared by reacting chlorobenzene with :

- (a) Chloroform
- (b) Carbontetra chloride
- (c) Ethane
- (d) Trichloro acetaldehyde

(xiv) When considering electrophilic aromatic substitution reactions the halids are described as :

- (a) Ortho/para directing and activating
- (b) Ortho/para directing and deactivating
- (c) Meta directing and activating
- (d) Meta directing and deactivating

(xv) Reichert meissl value :

- (a) Number of ml of 0.1 N KOH mix with 5 gm of fat for neutralization of water soluble volatile fatty acid

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(b) Number of ml of 0.1 N KOH mix with 5 gm of fat for neutralization of water insoluble volatile fatty acid

(c) Number of gm of KOH mix with 100 gm of fat for neutralization of water soluble volatile fatty acid

(d) Number of gm of KOH mix with 100 gm of fat for neutralization of water insoluble volatile fatty acid

(xvi) Polenske value :

(a) Number of ml of 0.1 N KOH mix with 5 gm of fat for neutralization of water soluble volatile fatty acid

(b) Number of ml of 0.1 N KOH mix with 5 gm of fat for neutralization of water insoluble volatile fatty acid

(c) Number of gm of KOH mix with 100 gm of fat for neutralization of water soluble volatile fatty acid

(d) Number of gm of KOH mix with 100 gm of fat for neutralization of water insoluble volatile fatty acid

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(xvii) Phenol is :

- (a) Antiseptic
- (b) Disinfectant
- (c) Both
- (d) None

(xviii) Which of the following is electrophilic substitution reaction?

- (a) Addition of electrophile and removal of hydrogen
- (b) Removal of electrophile and hydrogen
- (c) Addition of electrophile and hydrogen
- (d) Removal of electrophile and hydrogen

(xix) Which of the following is used for manufacturing of synthetic resin?

- (a) Phenanthrene
- (b) Naphthalene
- (c) Quinoline
- (d) Benzothiophene

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(xx) When halogen is added to basic compound?

- (a) Electrophilicity increase
- (b) Electrophilicity decrease
- (c) Nucleophilicity increase
- (d) Nucleophilicity decrease

Section-'B' **2×10=20**

Note : Attempt any 2 out of 3. Each question carries 10 marks.

2. Long answer type questions :

- (i) Discuss about stability of cyclo alkanes with various theory.
- (ii) Explain electrophilicity substitution of benzene with example of various substituents.
- (iii) Define fats and oils. Explain various analytical constants and principles involve in their determination.

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Section-'C'

7×5=35

Note : Attempt any 7 out of 9. Each question carries 5 marks.

3. Short answer type questions :

- (i) Draw orbital picture and resonance of benzene.
- (ii) Explain mechanism of Friedel Crat Mechanism and any one example.
- (iii) Preparation, IUPAC and uses of DDT.
- (iv) Preparation, IUPAC and uses of resorcinol.
- (v) Explain basicity order of amines.
- (vi) Write synthesis and reaction of triphenyl methane.
- (vii) What do you mean by saponification and rancidity of oils?
- (viii) Explain the substitution effect, on acidity of Phenol.
- (ix) Explain aromaticity and non aromaticity with example.

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**B. Pharmacy (Third Semester) Examination,
Nov.-Dec. 2021**

(PCI Scheme)

(Pharmacy Branch)

**PHYSICAL PHARMACEUTICS-I
THEORY (BP302T)**

Time Allowed : Three hours

Maximum Marks : 75

Note : This question paper contains three parts A, B, C. Part A, contain MCQ total 20 with 1 marks each and attempt all. Part B contain 3 long answer question from these attempt 2 with 10 marks each. Part C contain 9 short answer question from these attempt any 7 with 5 marks each.

Part-A

1×20=20

Note : Answer all the following questions. Each question carries 1 marks.

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1. Multiple Choice Questions :

- (i) The solution which obey the Raoult's law is known as :
- Ideal solution
 - Real solution
 - Binary solution
 - Supersaturated solution
- (ii) The solubility of drug will be high when it is in its :
- Stable form
 - Metastable form
 - Unstable form
 - None of the above
- (iii) According to USP, sparingly soluble means the parts of solvent required for one part of solute is :
- 30 - 100
 - 10 - 30
 - 100 - 1000
 - Less than 1

- (iv) At specific temperature, maximal amount of a solute that can dissolve in an amount of solvent is known as :
- Solubility
 - Dissolution
 - Diffusion
 - Capacity
- (v) Fick's law is used for study of :
- Dissolution rate
 - Disintegration rate
 - Dissociation rate
 - Diffusion rate
- (vi) The rate of diffusion according to Fick's first law of diffusion is proportional to the :
- Concentration gradient
 - Area of the surface
 - Both (a) and (b)
 - None of the above
- (vii) Which of the following states that the pressure of

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a fixed amount of gas at a constant temperature is inversely proportional to the volume of the gas :

- (a) Charle's law
 - (b) Boyle's law
 - (c) Avogadro's law
 - (d) Law of conservation of mass
- (viii) The relationship between pH, pKa and extend of ionization is decreased by :
- (a) Fick's equation
 - (b) Snell's law
 - (c) Henderson - hasselbalch equation
 - (d) Michaelis menten equation
- (ix) Velocity of light is maximum to :
- (a) Diamond
 - (b) Water
 - (c) Vacuum
 - (d) Glass
- (x) The instrument used for measuring particle volume is :

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- (a) Coulter counter
 - (b) Hempel burette
 - (c) Andreasen pipette
 - (d) Helium-densitometer
- (xi) Mercury displacement method is used to determine the :
- (a) Granule diameter
 - (b) Granule density
 - (c) Granule area
 - (d) Granule volume
- (xii) High angle of repose of the granules indicates :
- (a) Smooth surface of the granules
 - (b) Rough surface of the granules
 - (c) High bulk density of the granules
 - (d) High Porosity of the granules
- (xiii) Porosity of a porous powder can be defined as :
- (a) Bulk volume / void volume
 - (b) Void volume / Bulk volume
 - (c) True volume / Bulk volume

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- (d) Bulk volume / True volume
- (xiv) The property of drug molecule that is usually modified by complexation is :
- (a) Particle size
 - (b) Particle shape
 - (c) Solubility
 - (d) All of the above
- (xv) Protein binding distribution of drug.
- (a) Increase
 - (b) Decreases
 - (c) Does not effect
 - (d) Prevents
- (xvi) What is the nature of drug which usually bind to the human serum albumin?
- (a) Ionic
 - (b) Non-ionic
 - (c) Acidic
 - (d) Basic
- (xvii) In which method, tonicity is calculated by adding

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water to the drugs to make an isotonic solution :

- (a) Sodium chloride equivalent method
 - (b) Cryoscopic method
 - (c) White Vincent method
 - (d) Potentiometric method
- (xviii) Cyroscopic method used for the calculations of isotonic solution is based on :
- (a) Molecular concentration of the drug
 - (b) Freezing point depression of the drug
 - (c) Boiling point elevation of the drug
 - (d) pH of the drug
- (xix) The term pH was first used by :
- (a) Soren peter lauritz Sorensen
 - (b) Louis Pasteur
 - (c) James Kelvin
 - (d) Alfred Columb
- (xx) Maximum buffer capacity occur when :
- (a) $\text{pH} = \text{pKa}$
 - (b) $\text{pH} > \text{pKa}$

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- (c) $\text{pH} < \text{pKa}$
(d) All of the above

Part-B

2×10=20

(Long Answer Type Questions)

Note : Attempt any two questions out of 3 questions.

Each question carries 10 marks.

2. Define solubility. Describe solubility parameters. Write the factors influencing solubility of drug.
3. Define complexation? Write classification of complexes and discuss in detail about inclusions complexes.
4. State the different methods used for the determination of particle size of powders and discuss in detail the Andreasen pipette method.

Part-C

7×5=35

(Short Answer Type Questions)

Note : Attempt any seven questions out of nine questions. Each question carries 5 marks.

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5. Describe the method of determining solubility of gases in liquid.
6. Discuss in detail about physicochemical properties of drug molecules?
7. Define angles of repose and describe what measure you will take to improve the flow property of powder.
8. Describe the methods for determining the surface area of particles.
9. Describe the method for adjusting tonicity in detail.
10. Define protein binding and also explain methods for determining protein binding.
11. Define polymorphism and its classification. What are the different methods used for characterization of polymorphs?
12. Explain different laws that are used to describe behaviour of gases.

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13. Write short notes on : (Solve any two)

- (i) Derived properties of powder
- (ii) Dissolution and drug release
- (iii) Sublimation critical point
- (iv) Buffer equation and its applications

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**B. Pharmacy (Third Semester) Examination,
Nov.-Dec. 2021**

(PCI Scheme)

(Pharmacy Branch)

PHARMACEUTICAL MICROBIOLOGY – THEORY

(BP303T)

Time Allowed : Three hours

Maximum Marks : 75

Note : This question paper contains three parts. A, B and C. Part-A contains 20 MCQ's of 1 mark each. All questions are compulsory in part-A. Part-B contains 3 long answer questions from part-B attempt any two carries 10 marks each. Part-C contains 9 short answer questions each of 5 marks. Attempt any 7 out of 9 questions from part-C.

Part-A

20×1=20

1. Multiple choice questions (MCQs) :

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- (i) The term vaccine was given by :
- (a) Flamming
 - (b) E. Jenner
 - (c) L. Pasteur
 - (d) R. Koch
- (ii) The process of sterilization is used in dairy industry is :
- (a) Segregation
 - (b) Pasteurization
 - (c) Fermentation
 - (d) Tyndallization
- (iii) Agar as a solidifying agent was first time used by :
- (a) Fleming
 - (b) R. Koch
 - (c) Leeuwenhoek
 - (d) L. Pasteur

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- (iv) The organs of locomotion in bacteria are :
- (a) Flagella
 - (b) Pilli
 - (c) Pseudopods
 - (d) Both (b) & (c)
- (v) The DNA present in bacteria is :
- (a) Single & Circular
 - (b) Double & Circular
 - (c) Single & Linear
 - (d) Double & Linear
- (vi) In stationary growth phase the growth rate is :
- (a) Equal to death rate
 - (b) Lower than death rate
 - (c) Exceeds death rate
 - (d) None of the above
- (vii) Blood agar medium is :
- (a) Selective medium
 - (b) Differentiate medium

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- (c) Selective differential medium
- (d) All the above
- (viii) Cryopreservation is :
- (a) Storage in liquid nitrogen
- (b) Storage in nitrogen gas
- (c) Storage in liquid hydrogen
- (d) Storage in paraffin
- (ix) Electron microscope was first developed by :
- (a) Knoll & Ruska
- (b) Glialo Glalie
- (c) Louis Pasteur
- (d) Antony Van Leunhoek
- (x) The purpose of simple staining is to demonstrate :
- (a) Cell size
- (b) Cell shape
- (c) Arrangement of bacterial cells
- (d) All the above

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- (xi) Which of the following are chemical indicators of sterilization :
- (a) Browner's tube
- (b) Witness tube.
- (c) Royce sachet
- (d) All the above
- (xii) Viruses are :
- (a) Smallest known infective agents
- (b) Obligate parasites
- (c) Ultra microscopic
- (d) All the above
- (xiii) Fungi to which of following categories :
- (a) Autotrophs
- (b) Chemoautotrophs
- (c) Chemoorganotrophs
- (d) Phagotrophs

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- (xiv) Destruction Or Inhibition of microorganisms in living tissues is known as :
- (a) Sanitization
 - (b) Incineration
 - (c) Dwormification
 - (d) Antisepsis
- (xv) The velocity of HEPA filtered air is measured by :
- (a) Galvanometer
 - (b) Speedometer
 - (c) Velometer
 - (d) Turbidometer
- (xvi) Glycerol may be used as preservative upto a percentage of :
- (a) 10
 - (b) 20
 - (c) 30
 - (d) 50

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- (xvii) Which instrument indicate the amount of pollutants present in water :
- (a) Incubator
 - (b) BOD
 - (c) Refrigerator
 - (d) Hot air oven
- (xviii) Crystal violet is used in :
- (a) Gram staining
 - (b) Spore staining
 - (c) Capsule staining
 - (d) Flagella staining
- (xix) Gram positive microorganisms have :
- (a) Violet color
 - (b) Green color
 - (c) Pink color
 - (d) Blank color
- (xx) The laminar air flow utilized for sterilization :
- (a) UV lamp

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- (b) IR lamp
- (c) Alcohol
- (d) None of the above

Part-B

(Long Answer Type Questions) 2×10=20

Note : Attempt any two question out of three questions. Each question carries 10 marks.

2. What are Disinfectant? Discuss in detail physical and chemical method used for disinfectant.
3. Discuss Bacteria. Classification of different types of bacteria and explain the structure of bacterial cell.
4. Discuss Sterilization. Explain different method of sterilization with suitable examples.

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Part-C

(Short Answer Type Questions) 7×5=35

Note : Attempt any seven question out of nine questions. Each question carries 5 marks.

5. Write note on Bacterial Growth Curve.
6. Write note on Staining Techniques.
7. Write a note on different types of Spoilage.
8. Explain in detail scope of Microbiology.
9. Write in detail Electron Microscope.
10. Explain the application of cell cultures in research.
11. Write in detail microbiological assay of antibiotics.
12. Write in detail note on sterility testing of pharmaceutical product.
13. Write note on Cultivation of Virus.

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**B. Pharmacy (Third Semester) Examination,
Nov.-Dec. 2021**

(PCI Scheme)

(Pharmacy Branch)

PHARMACEUTICAL ENGINEERING

[Theory (BP304T)]

Time Allowed : Three hours

Maximum Marks : 75

Note : Answer all questions from Section-'A'.

Attempt any two questions from Section-'B'

and seven questions from Section 'C'.

Section-'A'

(Multiple Choice Questions) 20×1=20

Note : Attempt all questions. Each question carries

1 mark.

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1. Choose the correct answer :

- (i) Manometers are the devices used for the measurement of :
- (a) Density
 - (b) Pressure
 - (c) Viscosity
 - (d) All
- (ii) Which of the following is not a type of energy loss :
- (a) Friction losses
 - (b) Enlargement losses
 - (c) Resistance losses
 - (d) Losses in flirting
- (iii) Bernoulli's theorem cannot be applied when the flow is :
- (a) Rotation
 - (b) Turbulent
 - (c) Unsteady
 - (d) All of these

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- (iv) Size Reduction is also known as :
- (a) Compaction
 - (b) Segregation
 - (c) Separation
 - (d) Comminution
- (v) The device which is used for making the temporary measurement of flow is :
- (a) Venturimeter
 - (b) Dull flow tube
 - (c) Orifice plate
 - (d) Pitot static tube
- (vi) Vaccum Distillation occur at :
- (a) Temperature below its boiling point
 - (b) High boiling point
 - (c) High temperature
 - (d) High atmospheric pressure
- (vii) Substance containing bound water are called :
- (a) Hygroscopic

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- (b) Non-Hygroscopic
 - (c) Efflorescent
 - (d) Deliquescent
- (viii) Which of the following factor influence rate of filtration :
- (a) Area
 - (b) Pressure
 - (c) Viscosity
 - (d) All of the above
- (ix) In pipe flow the critical Reynolds Number is :
- (a) 640
 - (b) 2000
 - (c) 64000
 - (d) 55×10^5
- (x) Which of the following theory describe rate of filtration :
- (a) Darcy law
 - (b) Poiseuille's equation

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- (c) Kozeny carman equation
 - (d) Noyes Whitney
- (xi) Reynolds number can be expressed by which of the following formula :
- (a) $Re = DUP/n$
 - (b) $Re = 2Dup/n$
 - (c) $Re = Dup/n$
 - (d) $Re = dup/n$
- (xii) Mechanism of fluid energy mill is :
- (a) Impact mechanism
 - (b) Attrition and impact
 - (c) Cutting
 - (d) None of the above
- (xiii) The mode of motion of separation method is :
- (a) Agitation
 - (b) Brushing
 - (c) Centrifugal force
 - (d) All of the above

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- (xiv) The SI unit of energy is :
- (a) Meter
 - (b) Calorie
 - (c) Joule
 - (d) Kelvin
- (xv) The centrifugal effect is :
- (a) Ratio of centrifugal and gravitational force
 - (b) Sum of centrifugal and gravitational force
 - (c) Product of centrifugal and gravitational force
 - (d) All of the above
- (xvi) Fourier's law is applied for :
- (a) Evaporation
 - (b) Centrifugation
 - (c) Drying
 - (d) Heat transfer
- (xvii) Which of this not comes under filtration :
- (a) Rotary drum filter
 - (b) Meta filter

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- (c) Seidtz filter
- (d) Centrifuge filter
- (xviii) Which of the following is a type of Manometer :
- (a) Simple manometer
 - (b) Inclined manometer
 - (c) Differential manometer
 - (d) All of the above
- (xix) Distillation does not involve in :
- (a) Evaporation
 - (b) Extraction
 - (c) Furification
 - (d) Seperation
- (xx) In drying process the final product is the form of :
- (a) Slurry
 - (b) Solution
 - (c) Solid
 - (d) Solvent concentrate

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Section-B $2 \times 10 = 20$

(Long Answer Questions)

Note : Attempt any two questions. Each question carries 10 marks.

2. Classify various devices of measurement of flow of fluids. Explain Bernoulli's theorem and its application in pharmaceutical industries.
3. What is centrifugal force? Explain theory of centrifugation with its classification. Describe in detail about construction and working of perforated basket centrifuge.
4. What is evaporation process? Discuss various factors affecting it. Write a note on film evaporator and forced circulation evaporator.

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Section-C $7 \times 5 = 35$

(Short Answer Questions)

Note : Attempt any seven questions. Each question carries 5 marks.

5. Define drying. Write the mechanism of drying.
6. Classify materials used for pharmaceutical plant construction.
7. Explain different type of corrosion. Discuss various methods for prevention of corrosion.
8. Write a detailed note on heat exchanger. Give various application of heat transfer in industrial process.
9. Explain in detail law governing size reduction. Describe in detail Ball mill.
10. Describe filter media and filter aids. Discuss factors influencing filtration.
11. Write objective, applications and theory of crystallization.

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12. Discuss various factors affecting selection of plant construction.

13. Write short note on : (any one)

- (i) Raoult's law
- (ii) Manometry