

Code No: R7204
JAWAHARLAL NEHRU TECHNOLOGY UNIVERSITY HYDERABAD
B.Pharmacy II year - I-Sem. – I Mid – Term Examinations, Aug/Sept. – 2009
PHYSICAL PHARMACY – II
Descriptive Exam – Question Bank
Unit – I
(SOLUBILITY & DISTRIBUTION PHENOMENA)

1. Define solubility. Discuss the intermolecular forces of attraction between solute & solvent in solubilization.
2. Explain about the factors affecting the solubilization of gases in liquids.
3. Define ideal & real solutions. Explain the effect of internal pressure on the solubility of liquids in liquids.
4. Define complete & partial miscibility with examples. Describe the influence of temperature and foreign substances on mutual solubility of binary mixtures.
5. Explain different methods for enhancing solubility of solids in liquids.
6. Write the equation for an ideal solution of a solid in liquid (explain all terms in eq) and its limitations.
7. Derive an equation for the mole fraction solubility of a nonpolar or moderately polar solute in non ideal solutions.
8. Define solubility parameter. Write the limitations of solubility parameter.
9. Explain in detail about extended Hildebrand solubility approach.
10. Explain the effect of temperature on solubility of strong electrolytes.
11. Calculate the solubility of weak electrolytes as influenced by pH & surfactants.
12. State & explain distribution law and its limitations. How it is modified when the solute undergoes association in one of the phases and dissociation in other solvents.
13. State and explain Henry's law. Write its applications.
14. Describe ideal solution of solids in liquid. write the method for determining the molar heat of fusion of solute
15. Describe the factors influencing solubility of solids in liquids.
16. Derive the modification of distribution law when the solute undergoes molecular association in one of the phases.

Cont.....[2]

[2]

Code No: R7204

17. Define solubility & partition coefficient. Explain how partition coefficient effects the preservative action of weak acids in oil in water emulsions
18. Describe the effect of partition coefficient on the drug absorption and drug action.
19. Define diffusion process. what are the laws that governs the diffusion process. Explain fick' laws with appropriate mathematical expressions.
- 20) a) Define solubility product.
- b) The measured solubility of silver chloride in water at 20°C is 1.12×10^{-5} mole/l. this is also the concentration of silver ion and the chloride ion because silver chloride as a strong electrolyte, is nearly completely dissociated. Calculate the solubility product of this salt.

Unit-II
(COMPLEXATION)

- 21) Define complexation. Classify and define different types of complexes with suitable examples. Describe briefly about metal complexes.
- 22) Define and classify organic molecular complexes. Describe the forces that hold together organic molecular complexes and give examples
- 23) What are inclusion compounds. Discuss briefly about the cyclodextrins
- 24) What are the methods to analyze the complexes. Discuss briefly about two methods.
- 25) Describe the factors affecting complexation.
- 26) Discuss about the following
- a) Chelates
 - b) Polymer complexes
- 27) Discuss briefly about
- a) Inorganic complexes
 - b) Clathrates
- 28) Discuss the uses of cyclodextrins in the field of pharmacy.
- 29) Write about
- a) Quinhydrone complex
 - b) Picric acid complex
 - c) Drug complex
- 30) Describe the solubility method and distribution method for the analysis of complexes
- 31) Discuss about the following
- a) Channel lattice type complexes
 - b) Layer type complex
 - c) Macromolecular complexes
- 32) Define metal complex. Write briefly about the inorganic complexes and chelates

Cont.....[3]

[3]

Code No: R7204

- 33) Discuss the following
- Molecular sieves
 - Cyclodextrins
- 34) Describe the methods that are used to analyse the complexes. Write about pH titration method.
- 35) Discuss the various factors which affect the complexation and protein binding.
- 36) Write about various forces that are involved in organic molecular complexes with examples
- 37) Define complexation and write about its applications
- 38) Write about
- Monomolecular inclusion complexes
 - Charge transfer complex in organic molecular complex
- 39) Define the three classes of complexes with suitable examples
- 40) Describe chelates and their physical properties

**Unit-III
(KINETICS)**

- 41) Define the order of a chemical reaction. Derive the Equation for first order kinetics with example. Discuss the salient features of it.
- 42) What is meant by order of a chemical reaction. Discuss about zero order reaction with suitable example.
- 43) Define the Rate & order of the reaction. Explain these with suitable examples.
- 44) Define the half life of Drugs. Discuss the importance of it. Derive its equation for zero order reaction.
- 45) Discuss about the purpose of stability testing of drugs with examples.
- 46) what are the specific reaction rate constant. how do you obtain first order reaction rate constant. derive the equation.
- 47) What is meant by second order reaction. Explain with example. Add a note on the pseudo first order reaction.
- 48) What are the various methods for determination of the order of reactions.
- 49) What is graphical method for identification of order of a chemical reaction. Discuss with example.
- 50) Explain about the substitution method for identification of order of reaction with examples.
- 51) What is meant of half-life equation? Explain it for various types of orders of reaction. how is it useful in the identification of an order.
- 52) What is Arrhenius equation. Explain it & add a note on its applications.
- 53) Explain the effect of temperature on Chemical reaction.
- 54) What is Energy of activation. How do you calculate it? explain.
- 55) What is meant by shelf life of drugs. How do you determine it for drugs. Explain any two methods.
- 56) What is meant by Accelerated stability testing of Drugs? Explain
- 57) What are the limitations of accelerated stability analysis. Explain.
- 58) Explain about the collision theory.

Cont.....[4]

[4]

Code No: R7204

- 59) State and explain about Transition State Theory.
- 60) How do drugs decompose. Explain briefly with suitable examples.
- 61) What are the various degradation pathways of drugs. Explain how you prevent them with suitable examples.
- 62) What are the various degradation pathways of drugs. Explain.
- 63) What is meant by 'Stability' of drugs. How do you stabilize the drugs from degradation. Explain.
- 64) What type of drugs are prone for Hydrolysis? How do you prevent it. Explain with suitable examples.
- 65) How do you prevent drugs from oxidation? Mention various approaches with suitable examples.

Unit-IV

(INTERFACIAL PHENOMENA)

- 66) Define surface tension and interfacial tensions and write about their applications in pharmaceutical sciences
- 67) List out the methods which are used to determine the surface and interfacial tensions. Discuss briefly about the capillary rise method
- 68) Discuss about Dunoy ring method
- 69) Write about spreading coefficient and its applications
- 70) What are surface active agents? Discuss about the HLB. Classify surfactants based on HLB value.
- 71) Describe the applications of surfactants in pharmacy
- 72) What is surface free energy? Explain how it is related to surface tension.
- 73) Describe different types of adsorption isotherms
- 74) What is interfacial phenomenon? Explain the different types of interfaces and mention the factors affecting them.
- 75) Explain briefly about the adsorption at solid interfaces
- 76) Write about the importance of HLB in the selection of surfactants in pharmaceutical dispersion system.
- 77) Explain in detail about the Freundlich and Langmuir adsorption isotherms
- 78) What is wetting phenomena? explain
- 79) Explain the concept of HLB. Describe the methods for the estimation of HLB value
- 80) Describe interfacial tension. Explain any one method for its determination.
- 81) Explain the phenomenon of electrical double layer formation at the interface
- 82) Discuss about electrical properties of interfaces
- 83) Define Nernst and Zeta potentials. Write the applications of zeta potential in pharmacy.
- 84) Write the applications of surfactants based on HLB scale
- 85) What is surface free energy. derive the surface tension from the pressure difference across the curved interfaces.

-oOo-