Question Paper

Exam Date & Time: 24-Nov-2023 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Physical Pharmaceutics I [PCE-BP302T - S3]

Marks: 75 **Duration: 180 mins.**

I Multiple Choice Questions (MCQs)

Answer all the questions. Section Duration: 30 mins

1) Solute X is distributed between 40 ml of organic and 60 ml of aqueous phase. The concentration of X in organic phase is 0.271 M and in water 0.0029 M at constant temperature. Calculate the partition coefficient of X assuming it exists as monomer in both solvents. (1) (1)

- 93.44
- 140.17
- 71.34
- 62.29

2) Release of drugs from ointments and creams can be predicted by knowing-------- of drug (1)

- Spreading coefficient
- Partition coefficient
- Critical micelle concentration
- Solubility parameter

3) Real solution Phase diagram is drawn as--------- (1)

- Mole fraction versus vapor pressure
- Mole fraction versus solubility
- Equilibrium concentration versus vapor pressure
- Equilibrium pressure versus solubility

4) On 'Tie line' of phenol-water system phase diagram the conjugate phases have --- of phenol (1)

- Same composition of phenol
- Constant composition
- Varying composition
- Smaller amount

5) Calculate the concentration in % v/v of a solution containing 20ml of solute and 250 ml of solvent. (1)

- 8.0 % v/v
- 12.5 % v/v
- 80 % v/v
- 7.40% v/v

6) Addition of electrolytes or non-electrolytes for vitamin A formulation is done to------ (1)

- decrease the surface

tension
increase the solubility
protect from oxidation
Protect from hydrolysis

7) As the temperature increases, the surface tension of liquids -------- (1)

Decreases
No alteration
Increases
Decreases until cmc

8) Langmuir adsorption is---------- (1)

Multilayer adsorption
Bilayer adsorption
Uni layer/multilayer adsorption
Mono layer adsorption

9) In adsorption isotherms "x/m" represents------- (1)

equilibrium concentration
ratio of mass of adsorbent to mass of adsorbate
rate of adsorption
extent of adsorption

10) Which of the following statement is correct regarding pH scale? (1)

It is negative logarithm of $H^{\pm}$ ion concentration
It is positive logarithm of $H^{\pm}$ ion concentration
It is a measure of buffer capacity
It is a 14point scale

11) What is the useful pH range of indicator with pK_a value 9.2? (1)

7.4 to 11.2
4.2 to 6.4
7.7 To 10.7
8 to 9.6

12) The appropriate method to determine pH of a colored solution is------ (1)

Colorimetric method
Titrimetric method
Litmus paper test
electrometric method

13) Change of state of material from a gas to a solid is known as: (1)

Fusion
Boiling
Deposition
Evaporation

14) Which type of liquid crystal consist of molecules in parallel layers? (1)

Cholesteric
Smectic
Nematic
All the above

15) Ligand in a coordination complexes: (1)

Donates a pair of electrons
Accepts one electron and share it
Accepts a pair of electrons
Donate one electron and share it

16) One of the following is an organic molecular complex: (1)

chelate
Quinhydrone complex
Inclusion complex
Clathrate

17) Buffer system present in human plasma mainly include: (1)

Carbonic acid
Boric acid
Acetic acid
Sulphuric acid

18) 0.1 %w/v sodium chloride solution when compared to physiological fluids is: (1)

hypertonic
hypotonic
isotonic
iso-osmotic

19) Buffer capacity can be defined as the ratio of increment of strong acid or base to the: (1)

change in pH
change in buffer index
change in viscosity
Change in osmotic pressure

20) When pKa of acetic acid is 4.76, what is the pH of the buffer solution containing 0.4M of acetic acid and 0.4M of sodium acetate, respectively? (1)

4.46
4.76
5.06
5.36

II Long Answers

Answer all the questions.

1) Explain the method of solubility determination for solid in liquid with labelled solubility curves. (10)

2) Write about the concepts and applications of optical rotation and dipole moment. (10)

III Short Answers

Answer all the questions.

1) Discuss micellar solubilization with neat labelled diagram. (5)

2)	Explain the principle/theory of determination of surface tension by drop weight method.	(5)
3)	Discuss the various phenomena involved in the changes of states of matter.	(5)
4)	Explain the pharmaceutical applications of chelates.	(5)
5)	Discuss the kinetics of protein binding of drugs using direct plot.	(5)
6)	Differentiate between colorimetric and electrometric method of pH determination.	(5)
7)	Discuss the derivation of buffer equation for a buffer system containing weak acid and its salt.	(5)

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