

Total No. of printed pages = 6

PY 132301

Roll No. of candidate

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2019

B.Pharm. 3rd Semester End-Term Examination
PHARMACEUTICS — II (Physical Pharmacy – I)
(Old Regulation)

Full Marks – 100

Time – Three hours

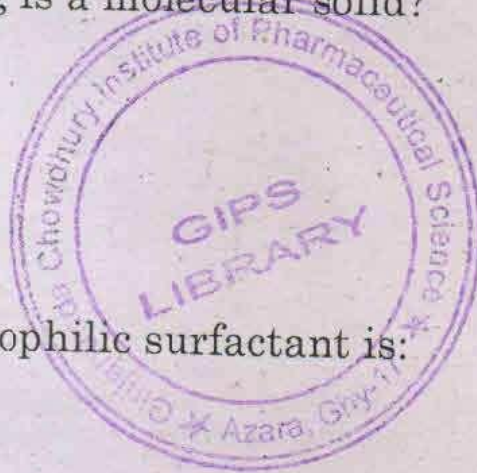
The figures in the margin indicate full marks
for the questions.

1. Answer the following : (any ten) (10 × 1 = 10)
- (i) Metastable polymorphs can be obtained by any one of the following:
- (a) Adsorption
 - (b) Rapid cooling
 - (c) Slow cooling
 - (d) Supersaturation

[Turn over

- (ii) Which of the following is correct:
- (a) Metastable polymorph represents high energy state, low MP and high aqueous solubility
 - (b) Metastable polymorph represents low energy state, high MP and high aqueous solubility
 - (c) Metastable polymorph represents high energy state, low MP and low aqueous solubility
 - (d) None of the above
- (iii) The conversion of metastable to stable form can be prevented by:
- (a) Size reduction
 - (b) Dehydration of molecule environment
 - (c) Decreasing the viscosity
 - (d) All of the above
- (iv) When energy is exchanged, but not mass, then such a system is known as:
- (a) Closed system
 - (b) Equilibrium system
 - (c) Isolated system
 - (d) Open system
- (v) Gibbs free energy is defined as: C
- (a) $\Delta G = \Delta H + (T/\Delta S)$
 - (b) $\Delta G = \Delta H + (TC_p)$
 - (c) $\Delta G = \Delta H - (T\Delta S)$
 - (d) $\Delta G = \Delta H - (T\Delta S)$

- (vi) Which of the following is a molecular solid?
- (a) Diamond
 - (b) Ice
 - (c) Sodium chloride
 - (d) MgO
- (vii) The HLB range for lipophilic surfactant is:
- (a) 2 to 9
 - (b) 9 to 16
 - (c) 16 to 20
 - (d) Above 20
- (viii) Gegenions means:
- (a) Amphiphilles
 - (b) Ions having charge opposite to the potential determining ions
 - (c) Ions having same charge as that of potential determining ion
 - (d) Potential determining ions
- (ix) In one of the methods, sodium chloride is added to adjust the isotonicity:
- (a) Cryoscopic method
 - (b) Hemolytic
 - (c) Sprowls method
 - (d) White-Vincent method
- (x) Which of the following inter-molecular attractions are responsible for lower boiling points of a liquid?
- (a) Dipole-dipole forces
 - (b) Hydrogen bonding
 - (c) Ion-dipole forces
 - (d) London forces



(xi) Hilderbrand-Scatchard equation is applicable to one of the following type of solutions:

- (a) Equilibrium
- (b) Ideal
- (c) Non-ideal
- (d) All of the above

2. Answer the following questions (Answer any Six out of eight questions). (6 × 15 = 90)

(a) (i) Match the following: (5 × 1 = 5)

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|-----------------------------|------------------------------------|
| (A) Solubility parameter | (1) Liquid crystals |
| (B) Mesophase | (2) Melting point |
| (C) Buffer action | (3) Molar heat of vaporization |
| (D) Polymorph | (4) Entropy |
| (E) Randomness of molecules | (5) Handerson Hasselbatch equation |

(ii) What is a eutectic mixture? Write its applications in pharmacy. (3)

(iii) Distinguish between crystalline and amorphous state. (4)

(iv) What is super critical fluid state? Give some examples of SCF. (3)

(b) (i) State Raoult's law. Describe the positive and negative deviations from the law. (5)

(ii) Define colligative properties. Derive an expression for the determination of molecular mass of solute using lowering of vapor pressure. (5)

(iii) List a few buffers used in pharmacy. What are physiological buffers maintained by human body. (5)

- (c) (i) Explain how crystallinity and polymorphism influences the drug properties in formulation perspectives. (5)
- (ii) State and explain Gibb's adsorption isotherm. Write its applications. (5)
- (iii) Explain the formation of electrical double layer with a neat labeled diagram. (5)
- (d) Write short note on the following:
(3 + 4 + 4 + 4 = 15)
- (i) Process of detergency
- (ii) Significance of spreading co-efficient
- (iii) Isothermal and adiabatic process
- (iv) Surface excess and its applications.
- (e) (i) Outline the concept of surface tension. Explain any one method for measurement of surface tension of liquids. (5)
- (ii) Explain the factors influencing the solubility gases in liquids (5)
- (iii) What are liquid crystals? Outline its properties and applications. (5)
- (f) (i) Briefly explain the factors influencing the solubility of solid drugs in liquids. Write the equation to calculate solubility parameter. Outline two important applications of solubility parameter. (5 + 5 = 10)
- (ii) Explain any one method for adjustment of isotonicity of pharmaceutical systems. (5)

- (g) (i) What are the types of thermodynamic systems? Explain the first law of thermodynamics with examples. (6)
- (ii) Describe the characteristics of a spontaneous reaction with examples. (4)
- (iii) Describe the importance of entropy in thermodynamics. (5)
- (h) Write short notes on: (4 + 4 + 4 + 3 = 15)
- (i) Debye-Huckel theory
- (ii) Buffer capacity
- (iii) Importance of partition co-efficient in pharmacy
- (iv) Freundlich adsorption isotherm.
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