

Physical pharmacy - II

QP Code : 15921

(3 Hours)

[Total Marks : 70]

- N.B.: (1) All questions are compulsory.
(2) Draw neat labelled diagrams wherever necessary.

- I. (a) A quantity of HCl ($1.5 \times 10^{-3}M$) is added to water at $25^{\circ}C$ to increase the hydrogen ion concentration to 1.5×10^{-3} mole/lit. What is the new hydroxyl ion concentration?
Given $K_w = 1 \times 10^{-14}$ at $25^{\circ}C$. 2
- (b) Write a note on solubility of gases in liquids. 3
- (c) Differentiate between molecularity of reaction and order of reaction. 3
- (d) Write a note on HLB. 3
- (e) Write a note on ion sensitive electrode. 2
- (f) Distinguish between Lyophilic and Lyophobic colloids. 2
2. (a) Write a note on buffers in pharmaceutical and biological systems. 4
- OR**
- (a) What is tonicity of solutions? Classify different methods of adjusting tonicity and explain Class II methods in detail. 4
- (b) What is phase rule? Explain phenol water system with a help of suitable diagram. 4
- (c) Derive the equation for the rate constant of a second order reaction (when $a = b$). 3
3. (a) Explain partition coefficient and give its applications. 4
- (b) Describe any two methods to determine order of reaction. 4
- OR**
- (b) Describe the effect of temperature on the rate of reaction. 4
- (c) What is adsorption isotherm? Explain in detail Freundlich adsorption isotherm. 3
4. (a) Derive the Henderson - Hasselbach equation for a weak acid and its salt. 4
- (b) Write a note on various types of electrodes. 3
- (c) List the different methods for preparation of colloids and explain any one method in detail. 4
- OR**
- Explain the optical and kinetic properties of colloids.
5. (a) Explain transition state theory. 3
- (b) Write a note on wetting and contact angle. 4
- (c) Write a note on the protective action of colloids. 4

OR

- (c) Write a note on Gold number and Schultz Hardy rule.
6. (a) A solution of a drug contained 500 units / ml when prepared. It was analyzed after 40 days and found to contain 300 units/ml. Assume the decomposition is first order, at what time will the drug have decomposed to one half of its original concentration ? 3
- (b) Define surface tension and explain the capillary rise method. 4
- (c) Write a note on concentration cells. 4
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