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16/12/09

Con. 5038–09.

Sem I

Physical Pharmacy - I

(2 Hours)

Oct.09

DY–6072

[Total Marks : 40

**N.B. :** (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from the remaining **five** questions.
(3) **All** questions carry **equal** marks.
(4) Draw **neat** labelled diagrams wherever **necessary**.

1. (a) What are the critical constants ? Derive relationships between critical constants and Vanderwaal's constants. 4
   (b) Describe an ebullioscopic method to determine molecular weight of a non-volatile solute. 4

2. (a) Derive the expression for the isothermal work of expansion of an ideal gas under variable pressure. 4
   (b) What is the effect of dilution of a strong electrolyte on specific and equivalent conductance ? 4

3. (a) Define the following :– 4
      (i) Heat of solution
      (ii) Heat of reaction
      (iii) Equilibrium state
      (iv) Intensive property.
   (b) A solution containing 0·5 gms of a new drug in 100 ml of water lowers the freezing point by 0·456°C at 25°C. What is the molecular weight of the drug ? (Molal freezing point constant of water = 1·86). 4

4. (a) What is specific rotation ? Discuss a method for determining the same. 4
   (b) Explain the principle of distillation of binary miscible liquids with suitable diagrams. 4

5. (a) Explain Arrhenius' theory of Electrolytic Dissociation. 4
   (b) The heat absorbed during the process of conversion of 3 moles of water to steam at 100°C and one atm pressure is 9850 cal/mole. Calculate Q, W and $\Delta E$. ($R = 0{\cdot}0821$ litre atm $deg^{-1}$ $mole^{-1}$) (Volume of one mole of liquid water at 100°C = 0·018 litre). 4

6. Write short notes on (any **two**) :– 8
   (a) Aerosols and their principle
   (b) Enthalpy
   (c) Osmotic pressure and its measurement.

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