

B.Sc. (Part-I) (New CBCS Pattern) Semester-II
USCCHT04 - Chemistry Paper-II - Physical Chemistry

P. Pages : 2

Time : Three Hours



GUG/W/24/11575(S)

Max. Marks : 50

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1. a) Find the maximum and minimum values of the function $2x^3 - 9x^2 + 12x - 3$ 5
- b) Define hydrolysis constant. Derive the relation between hydrolysis constant and dissociation constant of salt of weak acid and strong base. 5

OR

- c) Evaluate $\log_{10} 40 + \log_{10} 2 - 2 \log_{10} (64)^{\frac{1}{2}}$ by using log table. 2½
- d) Discuss the factors affecting the degree of ionization. 2½
- e) What is solubility product? Discuss any two applications of solubility product. 2½
- f) Explain the term permutation and combination. 2½
2. a) State Joule Thomson effect. Describe Joule Thomson experiment. 5
- b) i) Derive Kirchoff's equation. 5
- ii) Explain state function and path function.

OR

- c) Explain intensive and extensive properties with examples. 2½
- d) Define molar heat capacity. Derive the relation $C_p - C_v = R$. 2½
- e) State and explain Hess's Law of constant heat summation. 2½
- f) Calculate maximum work when 5 moles of an ideal gas expands isothermally and reversibly from 1 dm^3 to 10 dm^3 at 300K. 2½
3. a) What are the postulates of kinetic theory of gases? Deduce Avogadro's law from kinetic gas equation. 5
- b) Derive Vander Waal's equation of state. 5

OR

- c) Describe Maxwell-Boltzmann law of distribution of molecular velocity. 2½
- d) What are the causes of deviation from ideal behaviour? 2½
- e) Calculate R. M. S. velocity of methane molecule at 27°C. 2½
- f) Describe critical phenomenon with suitable example. 2½
- 4.** a) Define surface tension. Describe the drop number method for the determination of surface tension. 5
- b) Explain 5
- i) Law of constancy of interfacial angle.
- ii) Law of rationality of indices.
- OR**
- c) Define viscosity Explain effect of temperature on viscosity. 2½
- d) What is Parachor value? Give its applications. 2½
- e) Derive Bragg's equation. 2½
- f) Describe crystal structure of CsCL. 2½
- 5.** Attempt **any ten** 1x10
- a) Find the slope of the line
 $x+2y=3$
- b) Find derivative of $(4x^3 + 9)$ with respect to 'x'.
- c) What is common ion effect?
- d) Define
- i) Adiabatic process.
- ii) Isochoric process
- e) State any two statement of first law of thermodynamics.
- f) What is meant by heat of reaction?
- g) State Boyle's Law.
- h) What is meant by most probable velocity?
- i) What is compressibility factor?
- j) Define
- i) Relative viscosity
- ii) Specific viscosity
- k) What is meant by space lattice?
- l) Draw crystal structure of NaCL.
