

M/S - CBCS

B.Sc Semester-II  
Physical Chemistry  
CH- 201

1902020 B

Maximum marks=80

Time Allowed : 3 Hrs

Note: Attempt five questions in all, selecting one from each unit. Each question carries 16 marks.

Unit-I

- 1 a) Integrate  $\int \sin x \sin 2x dx$  5  
b) A pair of dice is thrown. Find the probability of getting a total of 8. 6  
c) Differentiate:  $x^2 \sin 1/x$  5  
2 a) What are colligative properties? State and explain Raoult's law for solutions containing non volatile 8  
solutes. 8  
b) What are Abnormal molecular masses? How is Van't Hoff factor related to degree of association and 8  
degree of dissociation?

Unit-II

- 3 a) Discuss pressure volume isotherm for  $CO_2$  and also relate it with critical constants. 10  
b) Derive reduced equation of state. 6  
4. a) What are perfect and imperfect crystals? Discuss the cause of imperfections in solids. 10  
b) Write a note on Law of constancy of interfacial angles. 6

Unit-III

- 5 a) Write a note on: 8  
i) Enthalpy of neutralisation.  
ii) Hess's law of constant heat summation 8  
b) Explain briefly Joule Thomson effect. 10  
6 a) Derive the relationship between heat of reaction at constant pressure and constant volume. 6  
b) Derive  $PV^\gamma = \text{constant}$ , for an adiabatic process.

Unit-IV

- 7 a) Derive Gibb's Helmholtz equation in terms of free energy and enthalpy change at constant pressure. 8  
Give its importance. 8  
b) State third law of thermodynamics. Give its utility. 8  
8 a) Derive Clausius-Clapeyron equation for solid-liquid equilibrium. Give its integrated form. 8  
b) Derive an expression for the entropy of mixing of ideal gases.

Unit-V

- 9 a) Discuss the effect of temperature on the rate of reaction. 8  
b) Derive an expression for first order reaction in integrated form. 8  
10 a) Discuss Ostwald's isolation method for the determination of order of reaction. 8  
b) Explain the concept of activation energy and threshold energy. 8