

Chemistry

M.Sc.

Semester-III

EC - 02

Physical Chemistry (Special)

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Full marks: 70

Time - 3 hrs

General instructions:

1. Question - 1 is compulsory.
2. Answer any four questions out of the seven questions.

1. Fill in the blanks:

10 × 1 = 10

- (i) The rate of evaporation from the first layer is equal to the on each Bare Surface.
- (ii) Helium behave as superconductor at Kelvin temperature
- (iii) At absolute zero temp. silicon acts as
- (iv) Atomic mass $\times \dots\dots\dots = 6.4$
- (v) P-type semiconductor is
- (vi) Poly sulphur nitride is the type of polymer.
- (vii) Atomic heat capacity at absolute zero temp.
- (viii) specific Surface area = $\frac{\text{Surface Area}}{\dots\dots\dots}$
- (ix) The value of $\frac{A_0}{N_i}$ for each of the acids = $(A^\circ)^2$
- (x) ~~Atomic mass~~ $\times 0.0001 = 0.64$
 $2d \sin \theta = \dots\dots\dots$

2. (a) Using diffraction of x-rays crystals discuss Debye Scherrer method. 8 × 7 = 15
- (b) Explain indexing powder pattern for cubic and tetragonal crystals.

3. (a) Deduce classical theory of specific heat of solids.
 (b) Prove that $C_V = 3R \left[\frac{12}{\pi^3} \int_0^\infty \frac{\psi^3 d\psi}{e^\psi - 1} - \frac{3\pi}{e^\pi - 1} \right]$ 8+7=15
4. (a) Explain the synthesis of polymer liquid crystals. 8+7=15
 (b) Discuss liquid crystalline order in biological material.
5. (a) Discuss the electrical conductivity of polymers. 6+9=15
 (b) Define NO. Average molar mass and weight average molar mass of polymers.
 Discuss light scattering method for determining molar mass of the polymers.
6. (a) Derive BET equation for multimolecular Adsorption isotherm.
 (b) Explain Electrokinetic Phenomenon. 10+5=15
7. (a) Discuss conduction band theory for the metallic conductivity.
 (b) Explain n-type and P-type Semiconductors. 10+5=15
8. (a) Explain microscopic theory of surface conductivity.
 (b) Discuss the applications of superconductivity transformations of order disorder transitions. 8+7=15

==X==

Set - II (2)

EC-02

(I) Rate of condensation

(II) 4

(III) Insulator

(IV) Specific heat

(V) ~~electric~~ electrical conductor

(VI) intrinsic

(VII) Electrical conductor

(VIII) vanishes

(IX) mass of Adsorbent

(X) 20

(XI) 11

— X —

Sagshi
23/04/2020

(3)