Kolhan University chaibasa Set – I (1)

Chemistry

M.Sc.

Semester – III

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EC - 02

Physical Chemistry (special)

Full marks : 70 Time : 3hrs

General Instructions:

1. Question-1 is compulsory.
2. Answer any 4 questions out of the 7 questions.

1. Fill in the blanks: 10 × 1 = 10

(i) Atomic mass × ..... = 6.4

(ii) n-type Semiconductor is ..... .

(iii) $2d \sin\theta$ = ...

(iv) Poly acetylene, Poly Sulphur nitride and poly para-Phenylene are the type of ..... polymer.

(v) Atomic heat capacity ..... at absolute zero temperature.

(vi) Specific Surface Area = $\frac{\text{Surface Area}}{\text{.....}}$

(vii) According to Langmuir
For each of the acids $CH_3-(CH_2)_{14}-COOH$, $CH_3-(CH_2)_{16}COOH$, $CH_3-(CH_2)_{24}COOH$ the value of $\frac{A_o}{Ni}$ = ... $(\text{Å})^2$

(viii) The Rate of evaporation from the first layer is equal to the ..... on each Bare Surface.

(ix) Helium acts as Superconductor at ..... Kelvin temp.

(x) Metals are the excellent electrical conductor because of .....

2. (a) Using diffraction of x-rays crystals Deduce Bragg's equation in reciprocal. 8 + 7 = 15

(b) Explain Fourier transform for x-rays diffraction.

3. (a) Derive BET equation for multimolecular Adsorption Isotherm.

(b) Explain Electrokinetic phenomenon. 10+5 = 15

4(a) Define and Explain
Metallic conductors, Insulators and Semiconductors.

(b) Explain n-type and p-type Semiconductors. 9+6 = 15

5. (a) Explain microscopic theory of Surface Conductivity.

(b) Discuss the applications of Superconductivity transformations of Order disorder transitions. 8+7 = 15

6. (a) Deduce classical theory of Specific heat of Solids.

(b) Prove that

$$C_V = 3R\left[\frac{12}{x^3}\int_0^x \frac{\psi^3 d\psi}{e\psi - 1} - \frac{3x}{e^x - 1}\right]$$

8+7 = 15

7. (a) Explain the synthesis of polymer liquid crystals.

(b) Discuss liquid crystalline order in biological material. 8+7 = 15

8. (a) Discuss the electrical conductivity of Polymers.

(b) Define no. Average molar mass and weight average molar mass.
Discuss sedimentation velocity method for determining molar mass of the polymers. 6+9 = 15

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Set - I (1)

EC-2 (Chemistry)

1. Answer

(i) specific heat

(ii) ~~Extrinsic~~ Extrinsic

(iii) n/l

(iv) electrical conductor

(v) vanishes

(vi) mass of adsorbent

(vii) 20

(viii) Rate of condensation

(ix) 4

(x) Metallic bond.

Sayoni
23/4/2020

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