Model Question Paper

Solid State - II - Part IV

12th Standard

Chemistry

Reg.No. : | | | | | | |

I.Answer all the questions.

II.Use Blue pen only.

Time : 01:00:00 Hrs

Total Marks : 65

Section-A

5 x 1 = 5

1) X - rays

(a) have very large wavelength (b) have wavelength $10^{-8}m$ (c) are electromagnetic wave (d) have wavelength $10^{-18}m$

2) The unoccupied points in a crystal are

(a) crystal vacancies (b) lattice vacancies (c) ionic vacancies (d) point vacancies

3) The number of positive ions are slight excess than the number of negative ions in

(a) Frenkel defect (b) Schottky defect (c) Line defect (d) Metal excess defect

4) Which one of the following statements is wrong about Frenkel defect?

(a) An ion occupies an interstitial position (b) An ion is much larger in size than the cation (c) The crystal remains neutral

(d) Non-stoichiometric compound is formed

5) The imperfection due to unoccupied lattice points in crystal is called

(a) Frenkel defect (b) Schottky defect (c) Line defect (d) Metal excess defect

Section-B

4 x 3 = 12

6) Define conductivity of a material. How are conducting materials classified?

7) Write the characteristic properties of a glass.

8) What is a unit cell?

9) How are crystals classified?

Section-C

5 x 5 = 25

10) The diffraction of a crystal with X-ray of wavelength 2.31$\mathring{A}$ gives a first order reflection at 28°.9′. What is the distance between the diffracted planes.

11) Diffraction angle 2θ equal to 14.8° for a crystal having interplanar distance in the crystal is 0.400 nm when second order diffraction was observed. Calculate the wavelength of X-ray used.

12) Find the interplanar distance in a crystal in which a series of planes produce a first order reflection from a copper X-ray tube (λ = 1.542 $\mathring{A}$) at an angle of 23.2°.

13) The X-ray of wavelength 1.5$\mathring{A}$ are incident on a crystal having an interatomic distance of 1.6$\mathring{A}$. Find out the angles at which the first and second order reflection take place.

14) Calculate the angle at which (a) first order reflection and (b) second order reflection will occur in an X-ray spectrometer when X-ray of wavelength 1.54A° are diffracted by the atoms of a crystal, given that the interplanar distance is 4.04A°.

Section-D

2 x 10 = 20

15) a) Give examples for molecular and ionic crystals

b) What is a metallic bond?

16) a) Write a short note on molecular crystals

b) Which type of defect is possible in FeO and FeS? Explain briefly

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