Total No. of Questions :4]

SEAT No. :

P2893

[Total No. of Pages :2

[5023]-407

M.Sc. -II

INORGANIC CHEMISTRY

CHI-431: Material Science - I

(Solid State & Other Inorganic Materials)

(2013 Pattern) (New 4 Credits) (Semester - IV)

Time :3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Neat labelled diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*

Q1) Answer the following questions: **[20]**

a) What is point defect? Explain its types.

b) Explain the origin of magnetism.

c) What are Hard and Soft ferrites?

d) Explain High Tc Superconductors.

e) Explain the intermetallic superconductors.

f) A piece of wood containing moisture weighed 165.3 gm and after oven drying showed constant weight is 147.5 gms. Calculate the moisture content.

g) What is the effect temperature on magnetic susceptibility value on paramagnetic materials? Explain with graphical representation.

h) What are ceramic materials? Explain with suitable examples.

i) What are Biomaterials? Explain with suitable examples.

j) Explain set-retardars & accelerators with suitable examples.

P.T.O.

Q2) Attempt any two of the following: **[10]**

    a)   State and explain Fick's laws of diffusion.

    b)   Derive the expression for the Curie law.

    c)   Explain orthopaedic & dental applications of biomaterials.

    d)   Explain the cement making process with flowsheet diagram.

Q3) Attempt any TWO of the following : **[10]**

    a)   What are different types of magnetism?

    b)   Explain Bardeen-Cooper- Schrieffer theory of superconductivity.

    c)   What are superconductors? Discuss the properties & applications of superconductors.

    d)   Saturation magnetisation of simple cubic iron is 1600 kA/m. Calculate the net magnetic moment of simple cubic iron atom. [Given Lattice parameter is 2.87°A.]

Q4) Write short notes on (Any two): **[10]**

    a)   Sol- gel process.

    b)   Fiber - reinforced plastics.

    c)   i)   Oil-well cement.

            ii)   Macrodefect free cement.

    d)   Hard and Soft wood.

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