Total No. of Questions : 4]

SEAT No. : ____

P1405

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M.Sc.-II
INORGANIC CHEMISTRY
CHI-431: Material Science-I
(Solid State & Other Inorganic Materials)
(2013 Pattern) (Semester-IV) (New 4-Credits)

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

Instructions to the candidates:

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

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

a) What is line defect? Explain its types.

b) What is dimagnetism? Explain with suitable example.

c) What are Spinels? Explain their types.

d) What is effect of temperature on magnetic susceptibility value of ferromagnetic materials? Explain with graphical representation.

e) Explain the synthesis of super conductors.

f) Explain the applications of super conducting materials.

g) A piece of wood containing moisture weighed 75.5 gm. and after over drying showed constant weight is 60.1 gm. Calculate the moisture content.

h) How ceramic materials are classified?

i) Give classification of Biomaterials.

j) Explain the hydration process of cement.

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

a) What is diffusion? Explain the different types of diffusion mechanisms.

b) What is Hysterisis loop? Explain with remanent magnetisation and coercive force.

c) Explain Cardiovascular and dental applications of biomaterials.

d) Explain different types of Portland cement.

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

a) Explain the different applications of magnetic materials.

b) Discuss BCS theory of Superconductors.

c) Explain Meissner effect. What are type I and type II Superconductors?

d) The saturation magnetisation of BCC iron is 1750 KA/m. Calculate the net magnetic moment per iron atom in BCC.

(Given: Lattice parameter=2.87°A)

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

a) Piezoelectric materials.

b) Macrostructure of wood.

c) Asphalt.

d) i) Macrodefect free cement.

ii) Oil-well cement.

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