Total No. of Questions :4]

SEAT No. :

P2894

[Total No. of Pages :2

[5023]-408

M.Sc. -II

INORGANIC CHEMISTRY

CHI-432: Material Science - II (Nano Materials)

(2013 Pattern) (4 Credit) (Semester - IV)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***All questions carry equal marks.***
3) ***Use of calculators is allowed.***

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

a) What do you mean baise, Forward baise and backward baise.

b) Complete the following reaction:

$$4Fe^{3+} + 3[BH_4]^- + 9H_2O \rightarrow ? + ? + ? + 6H_2 \uparrow$$

c) What is carbon nanotube? Classify the carbon nanotubes.

d) Give one example of targeted drug delivery using metal nanoparticles.

e) Explain hot-spot mechanism in synthesis of nanoparticles.

f) Write in brief different types of sensors and their applications.

g) How SEM is useful in characterization of nanoparticles.

h) List out important applications of nanoparticles.

i) Define piezoelectricity and pyroelectricity.

j) How silver nanoparticles are prepared. Give the chemical reaction involved in it.

P.T.O.

Q2) Answer the following (any two): **[10]**

a) Discuss the modification of nanostructured metal oxides films with dyes.

b) Explain arc discharge and laser ablation method for synthesis of carbon nanotubes.

c) How nanoparticles are synthesized by solvothermal method?

d) Discuss the classification of nanomaterials.

Q3) Answer the following (any two): **[10]**

a) Explain the mechanism of fluorescence and phosphorances with the help of energy level diagram.

b) What is sonochemistry? Give sonochemical fabrication of nanomaterials.

c) What are semiconducting nano materials? Give method of preparation of semiconducting metal sulphides.

d) Give any five applications of nanomaterials.

Q4) Answer the following (any two): **[10]**

a) Give comparison between SEM and TEM.

b) Explain the spectral and electrical properties of nanoparticles.

c) Discuss the zero valent Fe- Cu bimetallic nanoparticles.

d) How Raman spectroscopy is useful in characterise nanoparticles.

ɛɛɛ