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10NT52

Fifth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Nanochemistry

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 Write note on following methods of synthesis of nano particles with suitable examples:
- a. Hydrothermal process. **(05 Marks)**
- b. Solvothermal process. **(05 Marks)**
- c. Sol-gel process. **(05 Marks)**
- d. Micro emulsion process. **(05 Marks)**

2 a. Explain the growth of metal and metal oxide nanocrystals with suitable example. **(10 Marks)**
b. Discuss the effect of capping agent on growth kinetics of nanocrystals with suitable example. **(10 Marks)**

3 a. Write note on properties and different types of bonding in clusters. **(10 Marks)**
b. Discuss in detail about cluster formation and cluster growth detection. **(10 Marks)**

4 a. Discuss the fundamental concept of surface and interfacial chemistry and write note on wettability concept. **(10 Marks)**
b. Discuss the self assembly of amphiphiles, miscelles and microemulsion with neat diagram. **(10 Marks)**

PART – B

5 a. Write note on synthesis, purification and functionalisation of carbon nanotubes. **(15 Marks)**
b. Discuss the concept of self assembly in nanowires. **(05 Marks)**

6 a. What are block copolymers? Write note on self assembly of block copolymers and block copolymer thin films. **(10 Marks)**
b. Discuss about the spatial confinement of block copolymer and nanoepitaxy. **(10 Marks)**

7 a. What are organic nanoparticles? Discuss in detail about the types and analytical methods used for characterization of organic nanoparticles. **(10 Marks)**
b. Write note on general methods of preparation and characterization of hydrophotic drugs and cyclodextrine. **(10 Marks)**

8 a. What is adsorption? Discuss the phenomenon of adsorption of surfactants at solid surface. **(10 Marks)**
b. Discuss about the different types of interactions in supramolecular chemistry approach. **(10 Marks)**

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