Unit 5

Question Bank

Syllabus :

Nanomaterials : Synthesis of nanomaterials: ball milling, sol-gel, vapour deposition growth, pulse laser, magnetron sputtering, lithography. Nano porous materials: zeolites, mesoporous materials, carbon nanotubes, graphene, nano FRPs, nano fabrics, bioresorbable and bio erodable materials, nano ceramic, nano glasses, nano biomaterials, nano implant associated materials. Characterisation of nano structures, spectroscopic techniques, automatic force microscopy.

1. Define nanomaterials and describe significant properties of it.
2. Describe the significant improvement of properties of nanomaterials over conventional materials.
3. Discuss the advantage, disadvantages, and applications of nanomaterials with examples.
4. Describe the synthesis processes of nanomaterials.
5. Describe ball milling / sol-gel / vapour deposition growth / pulse laser / magnetron / sputtering / lithography techniques for the synthesis of nanomaterials.
6. Describe top down and bottom-up approach for the synthesis of nanomaterials with example.
7. Describe the properties and applications of following nanomaterials with examples.
   i) Nano porous materials
   ii) Zeolites
   iii) Mesoporous materials
   iv) Carbon nanotubes
   v) Graphene
   vi) Nano FRPs
   vii) Nano fabrics
   viii) Bioresorbable materials
   ix) Bio-erodable materials
   x) Nano ceramics
   xi) Nano glasses
   xii) Nano biomaterials
   xiii) Nano implant associated materials.
8. Describe the following characterization techniques of nanostructures
   i) Spectroscopic techniques – XRD, FTIR, SEM, TEM, XPS

ii) Automatic force microscopy (AFM).