Code No: **R203103I** **R20** SET - 1

III B. Tech I Semester Regular Examinations, Dec/Jan -2022-23

NANO TECHNOLOGY

(Common to CE,ME,ECE,CSE)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) What is nanotechnology and explore its importance? State the conditions for strong quantum confinement. [7M]
   b) Provide the justification for "Emerging Nanotechnology". [7M]

(**OR**)

2. a) Discuss the Classification of Nano structured materials in detail. [7M]
   b) List out applications of Nanomaterials and neatly explain any two of them. [7M]

UNIT-II

3. List out the important mechanical properties of material at nano level? Explain any three in detail. [14M]

(**OR**)

4. a) Mention and explain various defects associated with nano crystalline materials. [7M]
   b) Describe how Nano dimensionality effectthe elastic properties of the materials. [7M]

UNIT-III

5. a) Explain the techniques of nanolithography with a neat sketch. [7M]
   b) Show your understanding aboutthe method of Self-assembly. [7M]

(**OR**)

6. a) List any three top-down approaches for the synthesis of nano-particles and explain any one of them. [7M]
   b) What is meant by spark plasma sintering? Discuss. [7M]

UNIT-IV

7. a) How do you determine the crystal structure using X-ray diffractometer? Discuss. [7M]
   b) Describe the working mechanism of TEM. [7M]

(**OR**)

8. a) What is the basic principle in Scanning Electron Microscope? How is it different fromoptical microscopy? Explain. [7M]
   b) Briefly discuss about the importance and working of Field Ion Microscopy. [7M]

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UNIT-V

9. a) Describe in detail the working principle, application, and advantages of microsystems. [7M]
   b) List out the characteristics of MEMS. Discuss. [7M]

(**OR**)

10. a) Discuss the applications of nanotechnology in agriculture and food packaging. [7M]
    b) Outline the applications of nanomaterials in medicine and discuss in detail about drug delivery. [7M]

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