Roll No. ..... **Total Pages : 02**

BT-7/M-20 **37014**

NANOTECHNOLOGY

ECE-421-E

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section.

Section I

1. (a) What is Nanotechnology ? Enumerate the challenges of Nanotechnology. **10**

(b) Give a note on crystal structures. **10**

2. (a) Discuss the applications of Nanotechnology in energy and environment. **10**

(b) Discuss the applications of Nanostructured thin films. **10**

Section II

3. (a) Explain the targeted drug delivery system using nano particles. **10**

(b) List out characterization techniques and explain any *two* of them. **10**

4. (a) Explain in detail, how TEM can be used to characterize the nanomaterials and nanostructures. **10**

(b) Describe the principle and different working modes of AFM and its advantages. **10**

Section III

5. (a) What are the effects of nanoscale dimension on mechanical properties ? Discuss briefly. **10**

(b) Discuss the electrical and optical properties of nano-materials. **10**

6. (a) Justify silicon as substrate material and mention its mechanical properties. **10**

(b) Discuss about magnetic properties like ferromagnetic, ferrimagnetics and antiferrimagnetic. **10**

Section IV

7. (a) Discuss the electrical and optical properties of nano-materials. **10**

(b) Explain in detail nanodevices. **10**

8. Explain the following in detail :

(a) Nanostructures in Electronics **10**

(b) Nanotransistors. **10**