

31/10/17

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Question Paper Code : 50641

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Sixth/Seventh/Eighth Semester

Electronics and Instrumentation Engineering

GE 6081 – FUNDAMENTALS OF NANOSCIENCE

(Common to Electrical and Electronics Engineering/Instrumentation and Control

Engineering/Manufacturing Engineering/Mechanical Engineering/Production

Engineering/Biotechnology/Chemical Engineering/Pharmaceutical Technology/

Polymer Technology)

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What are nanowires ?
2. How does the optical property of material vary in nano regime ?
3. What do you mean by self-assembly of nanostructures ?
4. Explain the principle of mechanical milling.
5. Write a note on Buckminster fullerenes.
6. Give a brief note on the applications of nanoclays.
7. Define the term 'Nanoindentation'.
8. Give the significance of high resolution imaging in nanomaterial characterization.
9. Differentiate between MEMS and NEMS.
10. Brief about the role of nanotechnology in targeted drug delivery.

50641



PART – B

(5×16=80 Marks)

11. a) Discuss the effect of nanotization on the properties of materials.

(OR)

b) What are nanostructured materials ? Classify nanostructured materials with suitable examples.

12. a) Write notes on :

i) Sputtering.

(8)

ii) MOMBE.

(8)

(OR)

b) Enumerate the different chemical methods of synthesis of nanomaterials and state its advantages and disadvantages.

13. a) In detail discuss the structure-property relationship of nanometal oxides with an example.

(OR)

b) Discuss in detail about quantum dots-its preparation, properties and applications.

14. a) Discuss in detail the principle and working of SEM with a sketch.

(OR)

b) Discuss the principle, working and application of XRD with a neat diagram.

15. a) What is the significance of nanobiotechnology ? Discuss briefly the use of nanoprobe in medical diagnostics.

(OR)

b) What are nanosensors ? Discuss briefly its application in biotechnology.