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**Question Paper Code : 53120**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Sixth/Seventh/Eighth Semester

GE 6081 — FUNDAMENTALS OF NANOSCIENCE

(Common to Electrical and Electronics Engineering/Electronics and Instrumentation Engineering/Instrumentation and Control Engineering/Manufacturing Engineering/Mechanical Engineering/Production Engineering/Bio Technology/Chemical Engineering/Pharmaceutical Technology/Polymer Technology)

(Regulation 2013)

(Also common to : PTGE 6081 — Fundamentals of Nano Science for B.E. (Part-Time) Seventh Semester – Mechanical Engineering/Sixth Semester – Electrical and Electronics Engineering – Regulation 2014)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are one dimensional nanomaterials?
2. How does the mechanical property of material vary in nano regime?
3. What do mean by MOMBE?
4. State the principle of bottom up approach with an example.
5. Differentiate carbon nanotubes from bucky balls.
6. Give a brief note on the applications of laser ablation.
7. Define the term 'SNOM'.
8. Write the importance of high resolution imaging in nanomaterial characterization.
9. What is a solar cell?
10. What is NEMS?

PART B — (5 × 13 = 65 marks)

11. (a) Write about the optical and thermal properties of nanomaterials.

Or

- (b) Explain the different ways of classifying nanomaterials with examples.

12. (a) Write notes on:

(i) Ultrasonication process.

(ii) MOCVD.

Or

- (b) Explain any two methods of chemical synthesis of nanomaterials and list their advantages and disadvantages.

13. (a) Describe the structure-property relationships of nanometal oxides with example.

Or

- (b) Discuss preparation, properties and applications of nanoclays.

14. (a) Describe the principle and working of AFM with a sketch.

Or

- (b) Discuss the principle, working and application of nanoindentation with a neat diagram.

15. (a) Explain the designing and uses of nanosensors with suitable examples.

Or

- (b) Discuss the role of nanotechnology in the fabrication of sun barrier products and antibacterial products.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the same preparation and the use of TEM in the characterization of Nano materials.

Or

- (b) Discuss the recent developments in the usage of quantum dots in drug delivery and sensor applications.