Reg. No. | | | | | | | | | | | | |

Question Paper Code : 21638

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Seventh/Eighth Semester

Mechanical Engineering

GE 2023/GE 608 – FUNDAMENTALS OF NANOSCIENCE

(Common to Electrical and Electronics Engineering/Geoinformatics/ Industrial Engineering/Manufacturing Engineering/Chemical Engineering/ Polymer Technology)

(Regulations 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are Nanomaterials?
2. What is the effect of particle size on the melting point of nanomaterials?
3. What are the two main methods of nanomaterial synthesis?
4. Briefly explain MOMBE.
5. Give reasons why lithography technique is needed for fabrication of nano devices.
6. What is meant by etch resists?
7. How samples are cleaned during the synthesis of nano materials?
8. Write a short note on vibration free environments.
9. Derive Bragg's law.
10. What is the principles of ESCA?

PART B — (5 × 16 = 80 marks)

11. (a) Give detailed classification of Nano structured materials.

Or

(b) How does the length scale or size, affect various material properties?

12. (a) Explain methods of synthesis of nanomaterials in the powder form.

Or

(b) Explain various thin film deposition techniques.

13. (a) Explain various lithography systems and processes.

Or

(b) Explain lithography methods by etching.

14. (a) Write in detail about the clean room and water purity requirements for nano material preparation.

Or

(b) Write in detail about the chemical and biological contamination and safety issues.

15. (a) Explain SEM and TEM.

Or

(b) Explain any four surface characterization techniques that make use of laser light.
