


FACULTY OF ENGINEERING

B.E. 4/4 (Mech/Prod.) II-Semester (Main) Examination, May / June 2012

Subject : **Nano-Materials & Technology**
(Elective-II)

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Write about Silicon based nanomaterials. (2)
2. Describe about nano-tribology. (2)
3. Discuss about Challenges in nano-technology. (3)
4. Explain Proximal probe technologies. (3)
5. Write about Nano wires. (2)
6. Write about the significance of characterization properties. (3)
7. Describe the concept of Lithography. (3)
8. Write about scanned probe techniques. (2)
9. Nano composites (3)
10. Nano biomaterials (2)

PART – B (5x10=50 Marks)

- 11.(a) Explain in detail about size and shape dependence of the material properties in terms of surface density at nano scale with an example. (6)
- (b) List out the applications of nano technology in conventional technologies. (4)
- 12.(a) Define bottom-up and top-down approaches with one example each. (5)
- (b) Discuss in detail about applications of thin film deposition in Nano-technology. (5)
- 13.(a) Write about AFM with neat sketch and their importance. (4)
- (b) Explain with examples and neat sketches about function advantages and applications of FFM. (6)
- 14.(a) Define carbon nano tube and discuss in detail about Nano tubes in terms of various physical and chemical properties. (5)
- (b) Discuss in detail about carbon Nano tubes formation and applications. (5)
- 15.(a) Explain with an example about classification of Nano structured materials. (5)
- (b) Discuss in detail about present and future applications of Nanomaterials. (5)
- 16.(a) Write about thin film deposition and doping techniques. (6)
- (b) Discuss in detail about synthesis of nanocomposites. (4)
17. Write short notes on the following :
 - (a) Special nanomaterials (3)
 - (b) Nano imprint fabrication (3)
 - (c) Importance polymer materials in the field of nano technology (4)