

CBCS Scheme

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15NT33

Third Semester B.E. Degree Examination, June/July 2018 Foundations of Nanoscale Science and Technology

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain Bohr atomic model with neat diagram and explain the 3 phases. (08 Marks)
b. Write a note on classical physics and Quantum mechanics. (08 Marks)

OR

- 2 a. Write a note on :
(i) Damascus Sword and Lycurgus cup (08 Marks)
(ii) Challenges of Richard Feynman. (08 Marks)
b. Discuss the interdisciplinary nature of nanoscience and nanotechnology. (08 Marks)

Module-2

- 3 a. What are semiconductors? Give a note on types of semiconductors. (08 Marks)
b. Define Quantum dots and Nanowires. Describe nanosheets with example. Mention the applications. (08 Marks)

OR

- 4 a. Define Nano composites. Explain its importance. (08 Marks)
b. Explain different structure of carbon nanotubes. Mention its applications.. (08 Marks)

Module-3

- 5 a. Write a note on Biomaterials as implant in human body. (05 Marks)
b. Explain Lotus effect. Mention the applications. (05 Marks)
c. Explain Velcro effect. Mention the applications. (06 Marks)

OR

- 6 a. Write a note on Biologically inspired mechanism. (06 Marks)
b. Define Biomaterials. Mention their uses. (06 Marks)
c. Explain Industrial significance of Biomimetic. (04 Marks)

Module-4

- 7 a. Discuss metal oxide nanoparticles TiO_2 , ZnO , SnO_2 and their application is Solar cells. (08 Marks)
b. Discuss the applications of semiconducting cadmium and selenide quantum dots bio-imaging. (08 Marks)

OR

- 8 a. Discuss the bottom gated and top gated graphene FET with neat sketch. (08 Marks)
b. Explain CNT – FET with neat diagram. (08 Marks)

Module-5

- 9 a. Write a note on :
i) Toxicology of air borne ii) Nanomaterials deposition studies. (08 Marks)
b. Discuss safety and pollution control techniques used for controlling nanomaterial pollution. (08 Marks)

OR

- 10 a. Describe waste disposal nanomaterials. (08 Marks)
b. Explain packing and Transportation. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. A candidate's answer sheet will be treated as malpractice if it is found to be written on the remaining blank pages.