

# CBCS SCHEME

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18NT32

## Third Semester B.E. Degree Examination, Dec.2019/Jan.2020 Foundation of Nanoscale Science and Technology

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Write a note on molecules and phases. (10 Marks)  
b. Discuss the inter disciplinary nature of nanoscience. (05 Marks)  
c. Discuss the challenges of Richard Feynman. (05 Marks)

OR

- 2 a. Write a note on classical physics and quantum mechanics. (10 Marks)  
b. Write a note on Domascus Sword and Lyncurgus cup, mention properties. (05 Marks)  
c. Define the term nano materials, write a brief note on origin of nano technology and its progress. (05 Marks)

### Module-2

- 3 a. Explain the different structures of carbon nano tubes and mention its applications. (10 Marks)  
b. Write a note on ceramics and explain their classification. (05 Marks)  
c. What are semiconductors? Give note on types of semiconductors. (05 Marks)

OR

- 4 a. Define quantum dots and nanowires. Describe Nanosheets with example. Mention its applications. (10 Marks)  
b. Explain Nano composites and their importance. (05 Marks)  
c. Define nano wires and explain the properties. (05 Marks)

### Module-3

- 5 a. Explain the Lotus effect and Velcro effect with their applications. (10 Marks)  
b. Write a note on Biologically inspired mechanism. (10 Marks)

OR

- 6 a. Define Biometrics, explain inspiration from nature, explain their industrial significance. (10 Marks)  
b. Explain the biological materials and their application. (10 Marks)

### Module-4

- 7 a. Discuss the bottom gated and top gated graphene FET with neat sketch. (10 Marks)  
b. Discuss metal oxide nanoparticles  $TiO_2$ ,  $TnO$ ,  $SnO_2$  and this application in solar cells. (10 Marks)

OR

- 8 a. Discuss applications of semiconducting cadmium and seleride quantum dots bio imaging. (10 Marks)  
b. Write a note on magnetic nano materials and their applications. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

**Module-5**

- 9 a. Discuss safety and pollution control techniques used for controlling nanomaterial pollution. (10 Marks)  
b. Write a note on storage of nanomaterials. (05 Marks)  
c. Write a note on Toxicology of airborne and nanomaterials deposition studies. (05 Marks)

OR

- 10 a. Explain the waste disposal of nanomaterials in detail. (10 Marks)  
b. Explain the packing and transportation of nanomaterials in detail. (05 Marks)  
c. Explain the nano materials pollution. (05 Marks)

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