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Sixth Semester B.E. Degree Examination, July/August 2022 Nano Electronics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Describe the concept of Molecular Orbital (MO) theory to explain bonding between atoms. (10 Marks)
- b. Explain how nanometer length scale effect magnetic properties. (10 Marks)

OR

- 2 a. Explain the effect of increasing the number of atoms on the electronic energy levels by one dimensional solid. (10 Marks)
- b. Briefly explain the methods for templating the growth of nano materials. (10 Marks)

Module-2

- 3 a. Explain Field ion Microscopy. (10 Marks)
- b. Evaluate the Quantum confinement in two dimensions : Quantum wires Quantum dots. (10 Marks)

OR

- 4 a. Explain the methods with a neat diagram, how an object is transformed into an image. (10 Marks)
- b. Write a note on Electronic density of States. (10 Marks)

Module-3

- 5 a. Explain the main steps involved in the formation of Self assembled quantum dots. (10 Marks)
- b. Explain Intraband absorption in Semiconductor nanostructures. (10 Marks)

OR

- 6 a. Explain Cleaved – edge overgrowth technique. (10 Marks)
- b. Explain the Phonon Bottleneck in Quantum dots. (10 Marks)

Module-4

- 7 a. Explain in brief the nature of Carbon bond in Carbon molecules. (10 Marks)
- b. Explain the experimental arrangement for synthesizing carbon nanotubes by Laser evaporation. (10 Marks)

OR

- 8 a. Explain Structure of Small carbon clusters with example. (10 Marks)
- b. Explain how semiconductor carbon nanotubes are used as sensitive detector of various gases. (10 Marks)

Module-5

- 9 a. Write a brief note on Nanosensors based on Quantum size effects. (10 Marks)
- b. Explain Optical Memories. (10 Marks)

OR

- 10 a. Write a note on Biosensors. (10 Marks)
- b. Explain Coulomb blockade device. (10 Marks)