

CBCS SCHEME



USN

--	--	--	--	--	--	--	--	--	--

15EC551

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Nanoelectronics

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define Moore's law. Mention its limitations. (03 Marks)
- b. In detail explain Top-down process and Bottom-up process. (08 Marks)
- c. Explain the concept of bonding between atoms. (05 Marks)

OR

- 2 a. Explain the concept of ordering in nanosystem. (06 Marks)
- b. With necessary diagram and equation, explain the concept of isolated atom. (10 Marks)

Module-2

- 3 a. With a neat diagram, explain scanning tunneling microscopy. (08 Marks)
- b. Define Bragg's law. Explain X-ray diffraction technique. (08 Marks)

OR

- 4 a. With a neat diagram, explain Acoustic Force Microscopy. (08 Marks)
- b. Derive an equation for total Energy of Quantum confinement in one, two, three dimension. (08 Marks)

Module-3

- 5 a. Explain different requirement used in ideal semiconductor. (08 Marks)
- b. With necessary diagram, explain Growth on vicinal substrate. (08 Marks)

OR

- 6 a. Explain the concept of quantum hall effect. (08 Marks)
- b. Briefly explain the concept of Band offsets and Resonant tunneling. (08 Marks)

Module-4

- 7 a. Briefly explain the applications of carbon nano tubes. (08 Marks)
- b. In detail explain electrical behaviour of carbon nano tubes. (08 Marks)

OR

- 8 a. What are carbon nanotubes? Explain carbon arc method used to develop carbon nanotubes. (08 Marks)
- b. Briefly explain the concept of carbon clusters and Alkali-doped C₆₀. (08 Marks)

Module-5

- 9 a. Define Nanosensors. Explain Nanoscale organization for sensors. (08 Marks)
- b. Explain the concept of Nanosensors based on its optical properties. (08 Marks)

OR

- 10 a. Write a note on injection lasers and optical memories. (08 Marks)
- b. In detail explain Nanosensor based on Quantum Size Effects. (08 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.