

Eighth Semester B.E. Degree Examination, Aug./Sept. 2020

Nano Photonics

Time: 3 hrs.

Max. Marks: 80

Note: i) For Regular Students: Answer any FIVE full questions irrespective of modules.

ii) For Arrear Students : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Write a note on :
 - i) Diffraction ii) Interference. (08 Marks)
- b. Explain Photonics Integrated Circuits and applications. (08 Marks)
- 2 a. Explain plasmons and metal optics. (08 Marks)
- b. Describe the applications of photonics. (08 Marks)

Module-2

- 3 a. Explain the confinement of photons and Electrons. (08 Marks)
- b. Write a note on :
 - i) Band gap
 - ii) Cooperative effects of photons and electrons. (08 Marks)
- 4 a. Explain similarities and differences of Photons and electrons. (08 Marks)
- b. Write a note on Co-operative emission. (08 Marks)

Module-3

- 5 a. Discuss the choice of materials for photonic crystal fabrication. (08 Marks)
- b. Write a note on Photonic Crystal Fibers. (08 Marks)
- 6 a. Write a note on :
 - i) 1D photonic crystals ii) 2D photonic crystals. (08 Marks)
- b. Write a note on wave guide. (08 Marks)

Module-4

- 7 a. Write a note on basic ideas and principles of Nano Photonic Devices. (08 Marks)
- b. Write a note on :
 - i) Device operation ii) Interconnection Devices. (08 Marks)
- 8 Explain the Evanescent wave and optical near field. (16 Marks)

Module-5

- 9 a. Explain the concept of
 - i) Inter connectors for nanophotonics. (08 Marks)
 - ii) Physical Hierarchy in Nanophotonics. (08 Marks)
- b. Elucidate the concept of Broadcast Interconnects. (08 Marks)
- 10 a. Discuss how the size and position of Nanoparticles are regulating using size dependent Resonance. (08 Marks)
- b. Describe the non-adiabatic nano fabrication concept in detail. (08 Marks)

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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.