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10NT54

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Nanophotonics

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Explain the properties of materials with respect to reflection, refraction, absorption and transmission of light. **(10 Marks)**
b. Define Optical filters. Explain any two types of optical filters. **(06 Marks)**
c. Define Interference and diffraction. **(04 Marks)**

2 a. Write a note on dielectric mirrors and interference filters. **(10 Marks)**
b. Discuss Microcavity effects in photonic crystals. **(10 Marks)**

3 a. Explain High – Q cavities. **(06 Marks)**
b. Write a note on wave guides. Name the types of wave guides. **(04 Marks)**
c. What are optical couplers? Discuss the types of optical couplers. **(10 Marks)**

4 a. Discuss briefly optical wave guide SPR coupling. **(10 Marks)**
b. Explain Grating SPR coupling with neat diagram. **(10 Marks)**

PART – B

5 a. Explain Nanoscale electronic energy transfer. **(06 Marks)**
b. Discuss Localization under a periodic potential. **(06 Marks)**
c. Write a note on quantum confinement effects. **(08 Marks)**

6 a. Write a note on Self – Assembling method Via Optical Near – Field Interactions – Regulating the size and position of Nanoparticles using Size – Dependent Resonance. **(10 Marks)**
b. Explain Adiabatic Nano fabrication, with a neat diagram. **(10 Marks)**

7 a. Explain Parallel Architecture using optical excitation transfer with the help of a neat diagram. **(10 Marks)**
b. Discuss Hierarchy in nanophotonics and its system fundamentals. **(10 Marks)**

8 a. Discuss Resonant Cavity quantum well lasers and light emitting diodes. **(10 Marks)**
b. Briefly explain Fundamentals of Cavity QED. **(10 Marks)**

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