1st Semester Regular / Back Examination – 2016-17
FIBRE OPTICS COMPONENTS & DEVICES
BRANCHS : COMMUNICATION SYSTEMS
Time: 3 Hours
Max Marks: 70
Q.CODE : Y905
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   Answer the following questions: (2 x 10)
- a) What are the elements of an optical fiber link?
- b) Give an overview of the pertinent characteristic of fiber-compatible luminescent sources.
- c) What is modulation bandwidth of LED?
- d) Draw the radiation patterns of LASER.
- e) Summarize some generic operating characteristics of Si, Ge, and InGaAs photodiodes.
- f) Draw the simple diagram of a SAM APD structure.
- g) Draw the three types of mechanical misalignments occurring between two joined fibers
- h) State some of the principal requirements of a good optical connector.
- i) What are different types of optical amplifiers?
- j) What do you mean by optical bi-stability?

Q2 a) What is duality of light? Which theory resolves this ambiguity & explains how?   (5)
  b) Draw the index profile diagram of all the three types of optical fibers to make distinction between them.   (5)

Q3 a) Consider an LED having a minority carrier life time of 5 ns. Find the 3-dB optical bandwidth and the 3-dB optical bandwidth.   (5)
  b) With neat diagram of structure of LED, explain the principle of operation   (5)

Q4 a) What is intensity modulation? How modulations of LASER diodes occur?   (5)
  b) Discuss Modal, Partition and Reflection noise. Why these are so important?   (5)

Q5 a) Explain the different techniques of fiber-to-fiber joint.   (5)
  b) What is splicing? Explain the techniques   (5)

Q6 a) What is the roll of fiber coupler? Explain the basic principle of three port and four port fiber couplers. State the fundamental technologies for making such couplers.   (10)

Q7 a) With simple energy-band diagram explain physical principles of photodiodes   (5)
  b) Discuss the principal noises associated with photo detectors.

Q8   Write short notes on any TWO.   (5 x 2)
- a) Integrated optical devices
- b) Beam splitters
- c) Optical switches
- d) Modulators