Code: 9A04702 **R09**

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December 2015

OPTICAL COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) List out the advantages and disadvantages of optical fiber communications.
(b) With respect to bandwidth explain how optical fibers are advantages over coaxial cables.

2 (a) Explain plastic optical fibers.
(b) Obtain a lasing threshold condition and from which find amplitude of modes, resonant frequencies, frequency and wavelength spacing between two consecutive modes.

3 (a) With the help of relevant expressions explain material dispersion and waveguide dispersion.
(b) List the difference between Intramodal and Intermodal dispersion.

4 (a) What is micro bending and how can it be reduced. Explain with diagram how the micro bending is minimized and avoided by compressible jacket.
(b) Explain the wavelength division multiplexing couplers.

5 (a) Draw a schematic of edge emitting double heterojunction LED and explain its working in detail.
(b) With respect to LED, what is internal quantum efficiency and derive the expression for the lifetime reduction caused by interfacial recombination.

6 (a) Explain the fiber to fiber joints.
(b) Write LENSING schemes for coupling improvements.

7 (a) The design of an optical receiver is much more complicated than that of an optical transmitter why. Explain.
(b) Give the block diagram of a fiber optic receiver showing different types of noise generated giving the expression for each type of noise.

8 (a) Explain about a bidirectional WDM system.
(b) Describe with diagram, the operation of unidirectional WDM system.

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