Code No. 3137

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (Main) Examination, December 2010

Subject: **Optical Fiber Communication (Elective – I)**

Time: 3 Hours Max. Marks : 75

Note: Answer all questions from Part A. Answer any **Five** questions from Part B.

PART – A (25 Marks)

1. An optical fibre has the following data $n_1 = 1.5$, $n_2 = 1.45$ calculate. 3
   (i) Critical angle (ii) Numerical Aperature
2. Define electrical and optical bandwidth. 3
3. How single mode fibre is different from multimode fibre. 3
4. Mention different types of refractive index profiles with neat sketch. 2
5. Mention different types of mechanical misalignments in fibre to fibre coupling. 3
6. What are the advantages of APD over PIN photodiodes? 2
7. What are different error sources in optical communication system? 2
8. What is mode coupling? 2
9. Why fibre splicers are used? 2
10. Differentiate between FDM & WDM. 2

PART – B (50 Marks)

11.(a) Differentiate between step Index and graded Index fibers. 5

(b) If the care layer of an optical fibre is made from silica with refractive index 1.45 and if the refractive index of the cladding layer is 1% less than that of the core calculate (i) cladding layer refractive index (ii) critical angle and (iii) numerical aperture. 5

12. Write detailed notes on linear and non-linear scattering loss mechanisms in optical fibers. 10

13. Explain the construction and operation of surface emitting and edge-emitting LEDS with necessary diagrams. 10

14. Write a detailed notes on gain guided laser diodes and index guided laser diodes with neat sketch. 10

15. Explain the detection process, in avalanche photo diode, and compare this with PIN photodiode. 10

16. Explain the principle of operation of a typical optical receives with necessary mathematical expressions? 10

17.(a) How WPM is better than FDM? Compare. 5

(b) What are the applications of WDM? 5