Total No. of printed pages = 3

Et-603/OFC/6th Sem/M/2013

OPTICAL FIBER COMMUNICATION

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Define the terms :

   (i) angle of incidence

   (ii) total internal reflection

   (iii) critical angle, and

   (iv) numerical aperture.

   (b) List some advantages and disadvantages of optical fiber cable. 8+6=14

2. (a) Draw the geometry of an optical fiber cable and label it. Classify different types of optical fiber.

(b) Draw the refractive index profile and light propagation in multimode step-index, multimode graded-index and single mode step-index fiber. 5+9=14

3. What are the optical fiber connectors ? What are the features of good connectors ? Name two basic types of fiber optic connectors and explain any one of them with neat diagram. 2+4+8=14

4. Draw a schematic diagram of photomultiplier tube and explain its working principle. Give three applications of photomultiplier. 11+3=14

5. What is active and passive coupler in fiber optics ? Name different types of optical coupler and write in brief about them. 2+12=14

6. Draw a block diagram of typical fiber optic receiver and explain it in brief. List some main types of receiver noise. 11+3=14

7. Name two optical source in fiber optics. Describe the construction and working principle of LEDs. Compare LEDs and Lasers. 1+8+5=14

8. Write short notes on any *two* : 2×7=14

(a) Photodiode

(b) Multiplexing in fiber optics

(c) Digital modulation

(d) Modes in optical fiber cable.