Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (ECE) (Sem.–7)

OPTICAL FIBER COMMUNICATIONS

Subject Code : EC-404

Paper ID : [A0329]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a. Define acceptance angle and critical angle.

b. Explain attenuation in optical fibre.

c. What is group velocity dispersion?

d. List all the basic components of a fiber optic cable & explain their functions.

e. List the advantages of using code division multiplexing.

f. Distinguish between spontaneous and stimulated emission.

g. Differentiate between step-index and graded index fiber.

h. Explain polarization mode dispersion in detail.

i. Draw the power-current characteristic of LED.

j. Differentiate between small and large signal modulation.

SECTION-B

2. Why we need optical fiber cables? Explain various types of fiber optic cables used in the industry.

3. What is WDM and list the reasons for its development as a major communication technology.

4. With a neat block diagram, explain the digital signal transmission through an optical data link.

5. What is link power budget? Derive expression for same.

6. What are the different types of noises present in the photodetector? Also, derive the expression for signal-to- noise ratio at the output of an optical receiver.

SECTION-C

7. Draw the energy band diagram of PIN diode and explain the VI characteristic of it. Also, explain its advantages in the application in optical receivers.

8. Describe the basic requirement for lasing and how they are achieved in a semiconductor laser? Also, explain how 'LASER' is used to measure distance and velocity by using an experimental technique.

9. Write short notes on following :

   a. Waveguide imperfection.

   b. Coupled cavity semiconductor lasers.