Roll No. ..... Total Pages : 03

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OPTICAL COMMUNICATION
ECE-419N

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Distinguish between single mode fiber and multimode fibers. **6**

(b) Why is step index single mode fiber preferred for long distance communication ? **5**

(c) A step index fiber has the normalized frequency of 26.6 at 1300 nm. If the core radius is 25μm, find the numerical aperture. **4**

2. (a) Discuss Optical fiber launching and coupling in brief. **7**

(b) What are the advantages of Graded Index Fiber ? **4**

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(c) Define Numerical aperture of the fiber. Why it can't be made very large ? 4

Unit II

3. (a) Explain in detail the losses in Optical fiber. 9

(b) Discuss the mechanism of Dispersion and bending losses in optical fiber. 6

4. (a) What is meant by attenuation ? Discuss the different mechanisms which are responsible for the attenuation in optical fiber. 9

(b) Explain how energy is lost from a "Leaky Mode". 6

Unit III

5. (a) Explain the working of p-i-n photodiode. Also explain the factors that limit the speed of response of photodiode. 8

(b) Briefly discuss the possible source of noise in optical fiber receivers. Describe the quantum noise in detail. 7

6. (a) What is the requirement for optical sources to feed into a fiber ? Write the advantages and disadvantages of LASER and LED. 7

(b) Explain the principle, construction and working of APD. 8

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Unit IV

7. (a) What is an optical network ? Discuss the elements and architecture of Fiber-Optic Network in brief. 8

   (b) Write short note on optical coupler and space switches. 7

8. (a) Why do we need optical networks ? Write the advantages of optical networks. 7

   (b) Briefly discuss the working of wavelength division multiplexer and demultiplexer. 8

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