Part D

7. A photodiode has a quantum efficiency of 65% when photons of energy 1.5×10^{-19} J are incident upon it.

(a) At what wavelength is the photodiode operating ?

(b) Calculate the incident optical power required to obtain a photo current of 2.5 μA the photodiode is operating as described above. **15**

8. Write short notes on any *two* of the following :

(a) Comparison of LED and LASER as optical sources.

(b) P-i-N diode population inverse in lasers. **7,8**

H46

B.Tech. EXAMINATION, May 2019

(Eighth Semester)

(B. Scheme) (Main & Re-appear)

ECE412B

OPTICAL COMMUNICATION

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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

Part A

1. (a) Why an optical fiber provides more signal security and immunity to interference as

compared to other means of transmission ? **8**

(b) Draw and electromagnetic spectrum and show where optical communication takes places. **7**

2. Differentiate :

(a) Single Mode and Multimode Fibers

(b) Step Index and Grade Index Fibers. **15**

Part B

3. When the mean optical power launched into an 8 km length of fiber is 120 μW, the mean optical power at the fiber o/p is 3 μW.

Determine :

(a) The overall signal attenuation or loss in decibels through the fiber assuming there are no connectors or splices.

(b) The signal attenuation per kilometer for the fiber.

(c) The overall signal attenuation for a 10 km optical link using the same fiber with splices at 1 km link intervals, each giving an attenuation of 1 dB;

(d) The numerical I/P/O/P power ratio in (c). **15**

4. (a) Explain different types of disperson in optical fibers. How dispersion affects optical bandwidth ? **15**

(b) What is dispersion flattered fiber ? **5**

Part C

5. (a) What is meant by fusion splicing of optical fibers ? **8**

(b) What are couplers and their function ? **7**

6. Draw a neat diagram explaining edge emitter LED. **15**