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B.Tec. (ECE) 7th Semester (G-Scheme)
Examination, December-2022
Paper-PCC-ECE-401 G
Fiber Optic Communication

Time allowed : 3 hours [Maximum marks : 75]

Note: Attempt five questions in total. All question carry equal marks. Question no. 1 is compulsory. Attempt one question from each unit.

1. (a) Explain Evanescent field.
(b) Enumerate difference between skew rays and meridional rays.
(c) Enumerate advantages of Quantum well lasers.
(d) Discuss the limitations of PIN diode detector.
(e) Discuss in details Intensity modulation.
(f) Enumerate advantages of solution transmission system. 6×2=15

Unit-I

2. (a) Draw the block diagram of optical communication system and explain working of each block in details. 9

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- (b) An optical fiber has NA of 0.20 and cladding reflecting index of 1.59 Determine (i) Acceptance angle for the fiber in water having refractive index of 1.33 (ii) Critical angle at the core cladding interface in air. 6
3. (a) What do you understand by attenuation? Explain losses due to linear scattering in optical fiber cable in details. 9
- (b) Discuss the step index and graded index fiber with the help of suitable diagram. 6

Unit-II

4. Explain the basic principle of operation and construction of LED. Also derive the equation for various type of efficiencies and how coupling efficiency can be improved when LED is used as light source. 15
5. (a) Explain working principles of APD when used as photo detector. Also give out its advantages and disadvantages. 9
- (b) What all factors should be kept in mind while selecting the semiconductor material for construction of photo detector? Explain in details. 6

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Unit-III

6. (a) Draw the block diagram of optical termination and distribution system for a star system. Also write and explain the elements of the loss equation. 9
- (b) Discuss various factors for calculating the path loss factors while doing link budgeting. 6
7. (a) Explain working of SOA. Also enumerate its advantages and uses. 9
- (b) Discuss in details sub carrier modulation. 6

Unit-IV

8. (a) Discuss Kerr effect and explain XPM and FWM in details. 9
- (b) Discuss in details soliton communication system. 6
9. Write short notes on the following: 2×7.5=15
- (i) Raman Scattering
- (b) Brillouin Scattering

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