

(3 Hours)

[Total Marks : 100]

N.B. 1 Question No. 1 is compulsory

2 Attempt any four questions from the remaining six questions

3 Assume suitable data wherever necessary and justify the same

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| 1. | a Draw the refractive index profile with dimensions of different types of fiber | 5 |
| | b Describe the concept of WDM | 5 |
| | c Distinguish Spontaneous and Stimulated Emission | 5 |
| | d Describe the Eye diagram as applicable to optical fiber Communications | 5 |
| 2. | a Explain any one fiber fabrication process with neat diagram. Compare the different methods of fabrication. | 10 |
| | b Starting from Maxwell's equation derive the wave equation for Step Index Fiber. | 10 |
| 3. | a Explain the Signal Attenuation in optical fiber and plot the three windows. | 10 |
| | b Describe the intermodal delay and intramodal dispersion in optical fiber. | 10 |
| 4. | a Describe with diagram the structure of a distributed feedback laser diode. | 10 |
| | b A silicon avalanche photodiode has a quantum efficiency of 65 percent at a wavelength of 900 nm. Suppose 0.5 μ W of optical power produces a multiplied photocurrent of 10 μ A. Find the multiplication M. | 10 |
| 5. | a Describe the different types of pre amplifiers used in optical receivers. | 10 |
| | b Explain with diagram the setup for making pulse dispersion measurements in time domain. | 10 |
| 6. | a Why Link Power Budget is important in optical fiber communication systems? Explain with an example. | 10 |
| | b Explain the different types of detections in Coherent systems. | 10 |
| 7. | Write short notes on any four | |
| | a OTDR | 5 |
| | b Fiber materials | 5 |
| | c Zero dispersion wavelength | 5 |
| | d Linearly polarised modes | 5 |
| | e Mode coupling | 5 |