Q.P. Code : 788700

(3 Hours) **[Total Marks : 80**

N.B. : (1) **Question no.1** is compulsory.
(2) **Attempt** any **three** questions from remaining questions.
(3) **Figures** to the right indicate **full** marks.

1. a) Compare Intramodal Dispersion and Intermodal Dispersion. **5**
b) Define Critical Angle, Acceptance Angle, Fresnel Reflection and External Reflection. **5**
c) Compare LED and LASER Sources. **5**
d) Differentiate DWDM and WDM Techniques. **5**

2. a) Explain OTDR working principle in detail. **10**
b) Derive an expression for Time Delay in Intermodal Dispersion. **5**
c) Calculate the number of modes at 1.3 μm wavelength in GIF having index profile $\alpha = 2$, core radius 25 μm, core refractive index 1.48 and cladding refractive index 1.46. **5**

3. a) Sketch the Refractive Index Profile of SIF and GIF. Derive an expression for Numerical Aperture and Number of Modes in SIF. **10**
b) Explain any one Fiber Fabrication Technique. **5**
c) Compare Isolators and Circulators. **5**

4. a) Derive an expression for Link Power Budget Analysis of optical fiber. **7**
b) Derive an expression for Responsivity of PIN photodiode. Differentiate PIN and RAPD photodiodes. **8**
c) Explain Front End Amplifiers in optical communication. **5**

5. a) Explain OTDM in detail. **10**
b) Describe SONET/ SDH in detail. **10**

6. Write a short note on **any two** :- **20**
a) Crosstalk
b) Dispersion
c) Optical Safety
d) Fault Management
