

(3 Hours)

[Total Marks: 80]

N.B.

- (1) **Question No.1** is compulsory
- (2) **Attempt** any **three** questions from remaining questions.
- (3) **Figures** to right indicate **full** marks

- 1. a) Explain the advantages and disadvantages of SONET/SDH **05**
b) Compare Linear and Nonlinear Scattering **05**
c) What is the Numerical Aperture of Fiber? Give its significance **05**
d) What is Optical Circulator? Give its applications. **05**

- 2. a) Explain in brief intermodal and intramodal dispersion in fiber **10**
b) A 6Km optical link consist of multimode step index fiber with a core refractive index of 1.5 and relative refractive index difference of 1%. Estimate **10**
 - (i) Delay difference between slowest and fastest modes at the fiber output
 - (ii) RMS pulse spreading due to intermodal dispersion on the link
 - (iii) Maximum bit rate that may be obtained without substantial errors on the link assuming only intermodal dispersion
 - (iv) Bandwidth Length product corresponding to (iii)

- 3. a) What are the different fiber fabrication methods? Explain double crucible method of fiber fabrication. **10**
b) What is optical amplifier? Compare different types of optical amplifiers **10**

- 4. a) Explain in detail working principle of PIN photodetector. Explain its merits and demerits **10**
b) What is OTN? Draw and explain its frame structure **10**

- 5. a) What are the advantages of OTDM? Explain its working principle **10**
b) Discuss the term power penalty with suitable system model **10**

- 6. Write short notes on any two **20**
 - a) Passive optical Network
 - b) Dispersion compensation
 - c) Performance and fault management in optical network
 - d) Optical safety
