(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
