Duration. ----3 Hours.   Total Marks :80.

Instruction:-
N.B.
1) Question No-1 is Compulsory.
2) Attempt any Three (03) Questions from remaining Five (05) Questions.
3) Assume suitable data where ever necessary.

Q. No.		Marks.

Q.1 **Attempt the following Questions(any4)**

a) Total Internal Reflection at the outer edge of the core-cladding? **5**

b) What do you mean by LP (Linearly Polarized) wave ,State difference between LP& circularly polarized wave ? **5**

c) Discuss basic block Diagram of Optical communication **5**

d) Explain the different types of losses in optical fiber communication **5**

e) Compare Dark current &optical current in Semiconductor **5**

f) What is Optical Transport network (OTN) **5**

Q.2(a) Explain Working of PIN photo diode ,Advantages of APD w.r.to Gain, &Responsively of diode **10**

Q.2(b) For GIF prove that $M = \dfrac{\alpha}{(\alpha T^2)} a^2 k^2 n_1^2 \Delta$ Discuss the possible sources of noise in optical fiber Receiver **10**

Q.3(a) Explain the different types of losses in optical fiber communication ,Give the various factors responsible for optical signal attenuation &Dispersion **10**

Q.3(b) Explain dispersion losses in an optical fiber ;How transmission rate calculated in dispersion Give the difference between couplers and connectors **10**

Q.4(a) Define the quantum efficiency and responsivity of photo detector, Derive an expression for the responsivity of Intrinsic photo detector **10**

Q.4(b) Difference between following term in context with optical communication(i)Optical Source &Optical Detector (ii)Coherent and Non coherent optical transmission **10**

Q.5(a) Describe the structure of OTDR Explain the method of Dispersion measurement using OTDR, compute maximum BW for the pulse dispersion of step Index single mode fiber that exhibits pulse dispersion of 25microsec.and has a total length of 50km. **10**

Q.5(b) Explain the term protocol and Internet protocol(IP),using OSI reference model discuss implementation aspect of the (i)SONET(ii)DWDM **10**

Q.6 Write short note on(any4): **20**
(a) Optical Coupler and Application
(b)SNR& Modifications of SNR for photodiode
(c)Optical safety &Service Interface
(d)Optical Switches
(e)SONET/SDH

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