



PILLAI COLLEGE OF ENGINEERING, NEW PANVEL
(Autonomous) (Accredited 'A+' by NAAC)
END SEMESTER EXAMINATION
May 2023

BRANCH: Electronics and Telecommunication Engineering

SEM VIII

Subject:- Optical Communication and Networks

Time: 03.00 Hours

Max. Marks: 80

Date: 02/05/2023

N.B 1. Q.1 is compulsory

Subject Code:ECC801

2. Attempt any three from the remaining four questions.

3. Each Question carry 20 marks.

Q.1.	Attempt All	Marks
a)	What do you mean by dispersion in optical fiber? Explain intermodal dispersion in detail.	5
b)	Explain the types of step index fiber with help of their refractive index profile.	5
c)	Draw and explain the elements of SONET infrastructure.	5
d)	What is crosstalk in optical system? Also explain types of crosstalk in optical transmission system.	5
Q.2.	Attempt All	
a)	An analog optical fiber system using LASER with 3 dBm optical power into air. A coupling loss of 17.5 dB is present while launching power into fiber. Length of fiber is 6 km with a loss of 5 dB/km. It is spliced at every 1.5 km with 1.1 dB loss per splice. Connector loss at receiver is 0.8 dB. The PIN receiver has sensitivity of -54 dBm. Estimated safety margin is 4 dB. Design the link power budget and determine its viability.	10
b)	Explain OTDR with help of neat diagram. Also explain OTDR Trace.	10
Q.3.	Attempt All	
a)	Explain in detail working principle of Avalanche Photodiode (APD). Also distinguish between PIN diode and APD.	10
b)	Define Acceptance angle. For an optical fiber with core refractive index of 1.50 and cladding refractive index of 1.45, Calculate i) Critical angle ii) Numerical Aperture iii) Acceptance angle	5
c)	Differentiate between Optical Isolator and Optical Circulator.	5

Q.4.	Attempt All	
a)	Explain OTDM in detail. Also explain bit interleaving and packet interleaving techniques used in OTDM.	10
b)	Explain MCVD method of fiber fabrication with help of neat diagram.	10
Q.5	Write Short note on:	
a)	Microbending loss.	5
b)	Fiber Bragg Grating.	5
c)	Network Management functions.	5
d)	Optical Transport Network (OTN).	5