K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

April – May 2024
(B.Tech) Program: Electronics & Telecommunication Scheme II
Examination: LY   Semester: VIII
Course Code: EXC801 and   Course Name: Optical Communication Networks

Date of Exam: 14/05/2024	Duration: 2.5 Hours	Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	What is meant by the refractive index of a material?	2	CO1	U
ii)	Why do we prefer step index single mode fiber for long distance communication?	2	CO1	U
iii)	What is meant by material dispersion?	2	CO2	U
iv)	What are the types of linear scattering losses?	2	CO2	U
v)	Write the advantages and disadvantages of LED	2	CO3	U
vi)	What is the function of a coupler?	2	CO4	U
vii)	Draw the STS-1 signal frame structure?	2	CO5	U
viii)	Define power penalty.	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	A silicon optical fibre with a core diameter large enough has a core refractive index of 1.50 and a cladding refractive index 1.47. Determine (i) the critical angle at the core cladding interface, (ii) the numerical aperture for the fibre (iii) the acceptance angle in air for the fibre.	4	CO1	U
ii)	Draw and explain various fiber alignment and joint losses.	4	CO2	U
iii)	Write note on population inversion?.	4	CO3	U

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iv)	Draw and explain the operation of the WDM system.	4	CO4	U
v)	Explain functional Layers of SONET.	4	CO5	U
vi)	Write a note on optical safety.	4	CO6	U
Q.3	Solve any two questions out of three.	16		
i)	Draw and explain the structures of single mode, multimode step index and multimode graded index fiber.	8	CO1	U
ii)	Explain the amplification mechanism in EDFA. Discuss the possible configurations of EDFA with a neat diagram.	8	CO4	U
iii)	Explain the structure and function of OTDM in detail.	8	CO5	U
Q.4	Solve any two questions out of three.	16		
i)	What are the types of fiber couplers? Explain in detail 2x2 coupler.	8	CO2	U
ii)	Draw and explain in detail Edge emitting LEDs.	8	CO3	U
iii)	Explain function of configuration management in detail	8	CO6	U

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