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

April – May 2023
(B.Tech) Program: Electronics & Telecommunication Scheme II
Examination: LY Semester: VIII
Course Code: EXC801 and Course Name: Optical Communication Networks

Date of Exam: 13/05/2023 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)	Define Numerical aperture and write its formula.	2	CO1	U
ii)	What is the fiber acceptance angle when n1=1,46 and n2=1.44?	2	CO1	Ap
iii)	Define signal attenuation of fiber and write its formula.	2	CO2	U
iv)	What are the types of dispersion?	2	CO2	U
v)	What are the advantages of LEDs?	2	CO3	U
vi)	What are the advantages of a Semiconductor optical amplifier (SOA)?	2	CO4	U
vii)	Draw the STS-1 signal frame structure of SONET?	2	CO5	U
viii)	Define power penalty in optical network.	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	Draw the schematic diagram of the optical fiber communication system. Explain the function of each block.	4	CO1	U
ii)	Write note on scattering losses.	4	CO2	U
iii)	Write down the differences between LED and Laser Diodes.	4	CO3	U
iv)	Explain term 'population inversion' in detail.	4	CO4	U
v)	Describe how a BLSR network restores traffic.	4	CO5	U
vi)	Write note on optical safety.	4	CO6	U
Q.3	Solve any two questions out of three.	16		

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i)	Explain the following with a neat diagram. 1. Single mode step index fiber. 2. Multimode step index fiber. 3. Multimode graded index fiber.	8	CO1	U
ii)	Draw and explain the operation of WDM components.	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)	Explain the fiber bending losses with a neat diagram.	8	CO2	U
ii)	Explain the structure and principle of working of Avalanche Photodiode (APD).	8	CO3	U
iii)	Explain function of configuration management in detail	8	CO6	U

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