

Code: 20EC4601A

**III B.Tech - II Semester – Regular Examinations – JUNE 2023**

**OPTICAL COMMUNICATIONS  
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
<b>UNIT-I</b>					
1	a)	Differentiate between step index and graded index fibers.	L2	CO1	6 M
	b)	A multimode step index fiber with a core diameter of 80 $\mu$ m and a relative refractive index difference of 1.5% is operating at a wavelength of 850nm. If the core refractive index is 1.48, Calculate: (i) 'V' number (or) normalized frequency (ii) The number of guided modes.	L3	CO1	8 M
<b>OR</b>					
2	a)	Which three bands of wavelength are used for optical fiber communication? What is Total internal reflection?	L1	CO1	6 M
	b)	Explain different causes of attenuation in optical fibers.	L2	CO1	8 M

<b>UNIT-II</b>					
3	a)	Explain the working principle of photo diode and construction of reach through Avalanche Photo Diode with a neat sketch.	L2	CO2	8 M
	b)	Illustrate the advantages of APD over pin diodes.	L3	CO2	6 M
<b>OR</b>					
4	a)	Describe a brief note on distributed feedback LASER.	L2	CO2	6 M
	b)	Discuss the operating characteristics of LED and LASER diodes.	L2	CO2	8 M
<b>UNIT-III</b>					
5	a)	Discuss about Source coupling fiber optic systems.	L2	CO3	7 M
	b)	What are fiber splices? Explain various fiber splicing techniques.	L2	CO3	7 M
<b>OR</b>					
6	a)	How fiber end preparation is done, explain?	L2	CO3	7 M
	b)	Discuss the concept of Wavelength Division Multiplexing with a neat diagram.	L2	CO3	7 M
<b>UNIT-IV</b>					
7	a)	Define the following: i) Thermal Noise ii) Modal Noise iii) Shot Noise	L1	CO4	7 M
	b)	With the help of a circuit, explain how LED Modulation is performed?	L2	CO4	7 M
<b>OR</b>					

8	a)	What are the digital modulation formats used in Optical Communications?	L1	CO4	7 M
	b)	Explain the working of Optical Heterodyne receiver.	L2	CO4	7 M
<b>UNIT-V</b>					
9	a)	Explain the Fiber optic analog System design.	L2	CO5	7 M
	b)	Illustrate briefly about any two applications of Fiber optics.	L3	CO5	7 M
<b>OR</b>					
10	a)	How Fiberless transmission is carried out? Explain.	L2	CO5	7 M
	b)	What are the parameters considered commonly for analog/digital system design?	L1	CO5	7 M