

ANURAG Engineering College
(An Autonomous Institution)

IV B. Tech I Semester Supplementary Examinations, April - 2024

OPTICAL COMMUNICATIONS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours

Max. Marks: 75

Section – A (Short Answer type questions)

(25 Marks)

Answer All Questions

	Course Outcome	B.T Level	Marks
1. Define Numerical aperture and acceptance angle of the fiber.	CO1	L1	2M
2. Find the critical angle of the fiber whose refractive index of core is 1.49 and cladding is 1.47.	CO1	L2	3M
3. Define waveguide dispersion.	CO2	L1	2M
4. List the types of fiber connecting techniques.	CO2	L1	3M
5. Write the examples of ternary and quaternary semiconductor materials.	CO3	L2	2M
6. List any three differences between LED and LASER diodes.	CO3	L1	3M
7. What are the required properties of a Photodiode?	CO4	L1	2M
8. What do you mean by sensitivity of a Photo detector?	CO4	L1	3M
9. Is power budget is required to be considered while designing optical system? justify.	CO5	L2	2M
10. List the components to be considered for link power budget.	CO5	L1	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks.

(5 X 10M = 50M)

11. A) Analyze i) Total Internal Reflection (ii) Normalized frequency (iii) Meridional rays (iv) Skew rays	CO1	L3	10M
OR			
B) Estimate the core diameter of a Step Index fiber which has a relative refractive index difference of 1% and a core refractive index of 1.5, the number of modes propagating at a wavelength of 1.3 μm is 1100.	CO1	L3	10M
12. A) Distinguish between fiber Splicing and connectors. Describe any one splicing technique in detail.	CO2	L3	10M
OR			
B) A glass fiber exhibits material dispersion by $\lambda^2(d^2n_1/d\lambda^2)$ of 0.025. Solve for material dispersion parameter at a wavelength of 850 nm.	CO2	L3	10M
13. A) Illustrate Fabry-Perot Resonator Cavity Laser Diode and explain	CO3	L2	10M
OR			
B) Relate the internally generated power of an LED with the drive current and derive the same.	CO3	L3	10M
14. A) Develop the expression for quantum efficiency and responsivity of a photo detector	CO4	L3	10M
OR			
B) Outline the concepts of probability of error and error sources in an optical receiver.	CO4	L3	10M
15. A) Analyze the rise time budget analysis with example	CO5	L3	10M
OR			
B) List out the features of WDM and discuss them in detail	CO5	L2	10M