

Test: CLAT- 4 (Assignment – 2)

Course Code & Title: 18ECE226T – Optical Components, Systems and Networks

Year & Sem: 4th Year / 7th Sem

Max. Marks: 30

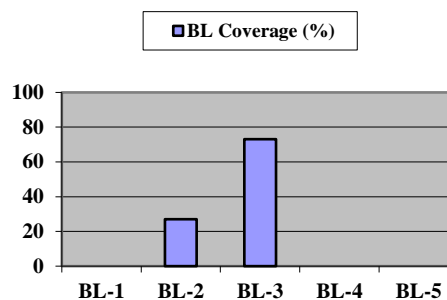
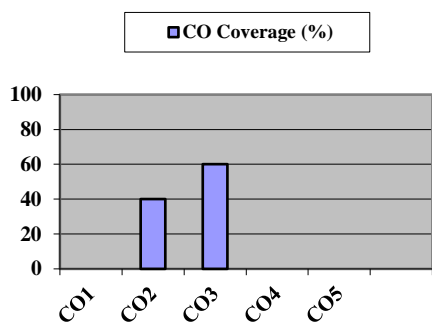
Course Articulation Matrix:

18ECE226T – Optical Components Systems and Networks			Program Outcomes (POs)																	
		Learning	Graduate Attributes												PSOs					
COs	At the end of this course, learners will be able to:	Blooms Level	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3			
CO-1:	Interpret the fundamentals of light transmission through an optical fiber and their attenuation mechanisms.	3	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-			
CO-2:	Express the principle and operation of various display devices, light sources, amplifiers, and various problems related to optical transmitters.	2	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-			
CO-3:	Analyze various photodetectors with their noise performance, receiver operation, and configuration.	4	1	3	-	2	-	-	-	-	-	-	-	-	3	-	-			
CO-4:	Examine the knowledge of various optical modulators and switches used in optical communication and acquaint with OEIC design	3	1	2	3	-	-	-	-	-	-	-	-	-	3	-	-			
CO-5:	Implement fiber optic links based on power budgets and multichannel optical communication systems using WDM and DWDM techniques	5	-	1	2	3	-	-	-	-	-	-	-	-	-	-	3			

(4 × 3 = 12, 8 × 1 = 8, 10 × 1 = 10 – Total 30 Marks)
Instructions: Answer ALL the Questions

Q. No	Question	Marks	BL	CO	PO
1	A given silicon avalanche photodiode has a quantum efficiency of 65% at a wavelength of 900 nm. Suppose 0.5 mW of optical power produces a multiplied photocurrent of 10 mA. What is the multiplication M?	4	3	3	2
2	An InGaAs pin photodiode has the following parameters at a wavelength of 1300 nm: $I_D = 4$ nA, $\eta = 0.90$, $R_L = 1000 \Omega$, and the surface leakage current is negligible. The incident optical power is 300 nW (–35 dBm), and the receiver bandwidth is 20 MHz. Find the various noise terms of the receiver and compute the SNR in dB.	10	3	3	2
3	A double-heterojunction GaAs LED ($n=3.7$) emitting at a peak wavelength of 1310 nm has radiative and nonradiative recombination times of 30 and 100 ns, respectively. The drive current is 40 mA. Find (a) the bulk recombination time; (b) the internal quantum efficiency; and (c) the internal power level. (d) the external quantum efficiency (e) the external generated power.	8	3	2	2
4	Neatly draw the functional block diagram of optical transmitter module.	4	2	2	1
5	Neatly draw the functional block diagram of optical receiver module.	4	2	3	1

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions



Approved by the Course Coordinator

Signature of the Question paper setter

Evaluation Sheet

Name of the Student:

Register No.:

(4 × 3 = 12, 8 × 1 = 8, 10 × 1 = 10 – Total 30 Marks)					
Q. No	CO	PO	Maximum Marks	Marks Obtained	Total
1	3	2	4		
2	3	2	10		
3	2	2	8		
4	2	1	4		
5	3	1	4		

Consolidated Marks:

CO	Maximum Marks	Marks Obtained
3	4	
3	10	
2	8	
2	4	
3	4	
Total	30	

PO	Maximum Marks	Marks Obtained
2	4	
2	10	
2	8	
1	4	
1	4	
Total	30	

Signature of the Course Teacher

Signature of the Course Coordinator

Signature of the Academic Advisor