SRM Institute of Science and Technology

College of Engineering and Technology

DEPARTMENT OF ECE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Academic Year: 2021-22 (Even)

Test: CLAT-4(Assi-1)

Course Code & Title: 18ECE322T Optoelectronics

Year & SEM: II year/ 4th SEM Max. Marks: 30

Course Articulation Matrix:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **18ECE322T – Optoelectronics** | | **Course Articulation Matrix** | | | | | | | | | | | | | | | | |
|  | **Course learning Outcome** | **Learning** | | | | | **Program Learning Outcome** | | | | | | | | | | | |
| **BL** | Graduate Attributes (GA) | | | | | | | | | | | | | (PSO) | | |
| **1** | **2** | **3** | **4** | | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | 1 | 2 | 3 |
| CLO1 | Define the basic concepts of optics and semiconductor optics | **1** | 3 |  |  |  | |  |  |  |  |  |  |  |  |  |  | 1 |
| CLO2 | Demonstrate the working principle of various photonic sources and display devices | **3** | 3 | 3 |  | 2 | |  |  |  |  |  |  |  |  |  |  | 3 |
| CLO3 | Analyse the principle and operation of various detectors and noise associated with it | **4** |  | 3 | 2 |  | |  |  |  |  |  |  |  |  |  |  | 3 |
| CLO4 | Interpret the various optoelectronic modulators, switches and interconnects | **3** | 3 | 2 | 3 | 3 | |  |  |  |  |  |  |  |  |  |  | 2 |
| CLO5 | Apply the concepts of integrated optoelectronic components and its applications in various fields | **3** | 3 |  | 3 | 3 | |  |  |  |  |  |  |  |  |  |  | 3 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Part – B (2 x 10 = 20 Marks)**  Instructions: Answer any two Questions | | | | | | |
| 1 | Derive the mean lifetime of electron under different illumination condition using the principle of recombination and generation. | 10 | 3 | 1 | 1 | 1.4.1 |
| 2 | 1. Discuss the terms refractive index and propagation constant. State the relation between these two parameters. 2. Using the Cauchy coefficients for diamond, calculate the refractive index at 610 nm. The Cauchy coefficients for diamond are n-2= -1.07X10^-5, n0= 2.378, n2= 8.01X10^-3, n4= 1.04X10^-4. (5+5) | 10 | 3 | 1 | 1 | 1.4.1 |
| 3 | (a) Describe in details about the principle of polarization by reflection  (b) An optical fibre made up the glass with refractive index n1 = 1.5 which is surrounded by another glass of refractive index n2. Find the refractive index n2 of the cladding such that the critical angle between the two cladding is 80°.  (c) Find the refractive index of the medium whose critical angle is 40°. (4+3+3) | 10 | 3 | 1 | 1 | 1.4.1 |