PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023

Semester : Semester VI - 2020
Course Code : ECE3022
Course Name : Sem VI - ECE3022 - Fundamentals of Photonics
Program : ECM

Date : 13-APR-2023
Time : 11:30AM - 1:00PM
Max Marks : 60
Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS (5 X 2 = 10M)

1. Define Wien's Displacement Law.

(CO1) [Knowledge]

2. State Malus law.

(CO1) [Knowledge]

3. Define Internal Quantum Efficiency.

(CO2) [Knowledge]

4. Recall Mode locking in LASER.

(CO2) [Knowledge]

5. Write down the equation for the Threshold condition of LASER.

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS (2 X 15 = 30M)

6. Einstein, in 1905, proposed light as something that possessed the characteristics of both wave and particle. Quantum mechanics later gave proof of the dual nature of light. Discuss the parameters in characteristics of the wave along with quantum mechanics in detail.

(CO1) [Comprehension]

7. Find out the optoelectronic device which works on the principle of Electro-luminance and explain its principle, working, characteristics, and applications in detail.

(CO2) [Comprehension]

ANSWER THE FOLLOWING QUESTION   **(1 X 20 = 20M)**

8. Band theory of solids is a theoretical model explaining the states of electrons, in the solid materials, that can have values of energy only within certain specific ranges. From the schrodinger equation, explain the formation of energy bands in solids.

(CO1) [Application]