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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**SUMMER TERM END TERM EXAMINATION AUGUST 2024**

**Date**: 05-08-2024

**Time**: 01:00 PM – 04:00 PM

**Max Marks**: 100

**Weightage**: 50%

**Semester**: Semester VI - 2024

**Course Code**: ECE3022

**Course Name**: Fundamental of Photonics

**Program**: B.Tech. (ECE)

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts*
3. *Scientific and non-programmable calculator are permitted*
4. *Do not write any information on the question paper other than Roll Number.*

**Part A [Memory Recall Questions]**

**ANSWER ANY FIVE QUESTIONS. (5Q x 2M = 10M)**

1. Compare coherent and non-coherent sources in interference. (C.O.No.01) [Knowledge]

2. Contrast LED Vs LASER. (C.O.No.02) [Knowledge]

3. Differentiate between thermal devices and photon devices. (C.O.No.03) [Knowledge]

4. State Keer effect. (C.O.No.03) [Knowledge]

5. Expand QCSE. (C.O.No.04) [Knowledge]

6. List out the disadvantages of hybrid optoelectronic integration. (C.O.No.04) [Knowledge]

7. State Pockel’s effect. (C.O.No.04) [Knowledge]

**Part B [Thought Provoking Questions]**

**ANSWER ANY TWO QUESTIONS (2Q x 15M = 30M)**

8. The photodetectors are classified based on the detection mechanism of light like the photoelectric or photoemission effect, polarization effect, thermal effect, weak interaction, or photochemical effect. Summarize the parameters involved in the detector’s performance. (C.O.No.03) [Comprehension]

9. Explain the concept that converts light energy to electricity along with different configurations.

(C.O.No.03) [Comprehension]

10. Explain the recording method of storing and retrieving data using a laser and magnet with relevant equations and diagrams. (C.O.No.04) [Comprehension]

**Part C [Problem Solving Questions]**

**ANSWER ANY THREE QUESTIONS. (3Q x 20M = 60M)**

11. Explain the equation in quantum mechanics which allows us to find the wave function for a given situation and describe its time-independent equation. (C.O.No.01) [Application]

12. Light-emitting diode (LED) is a widely used standard source of light in electrical equipment. It has a wide range of applications ranging from your mobile phone to large advertising billboards. Explain the principle, working, properties, and applications of LED in detail.

(C.O.No.02) [Application]

13. A magnetic field is applied to a medium, in a direction parallel to light which results in a change in the rotation of polarization. Explain the magneto-optic Faraday effect with magneto-optic modulators.

(C.O.No.03) [Application]

14. Explain the concept of optical crossbar switches and switching devices in detail.

(C.O.No.04) [Application]