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H – 3387

**Eighth Semester B.Tech. Degree Examination, November 2019**

**08.815 INTEGRATED OPTICS AND PHOTONIC SYSTEMS (T)**

**(2008 Scheme)**

Time : 3 Hours

Max. Marks : 100

PART A

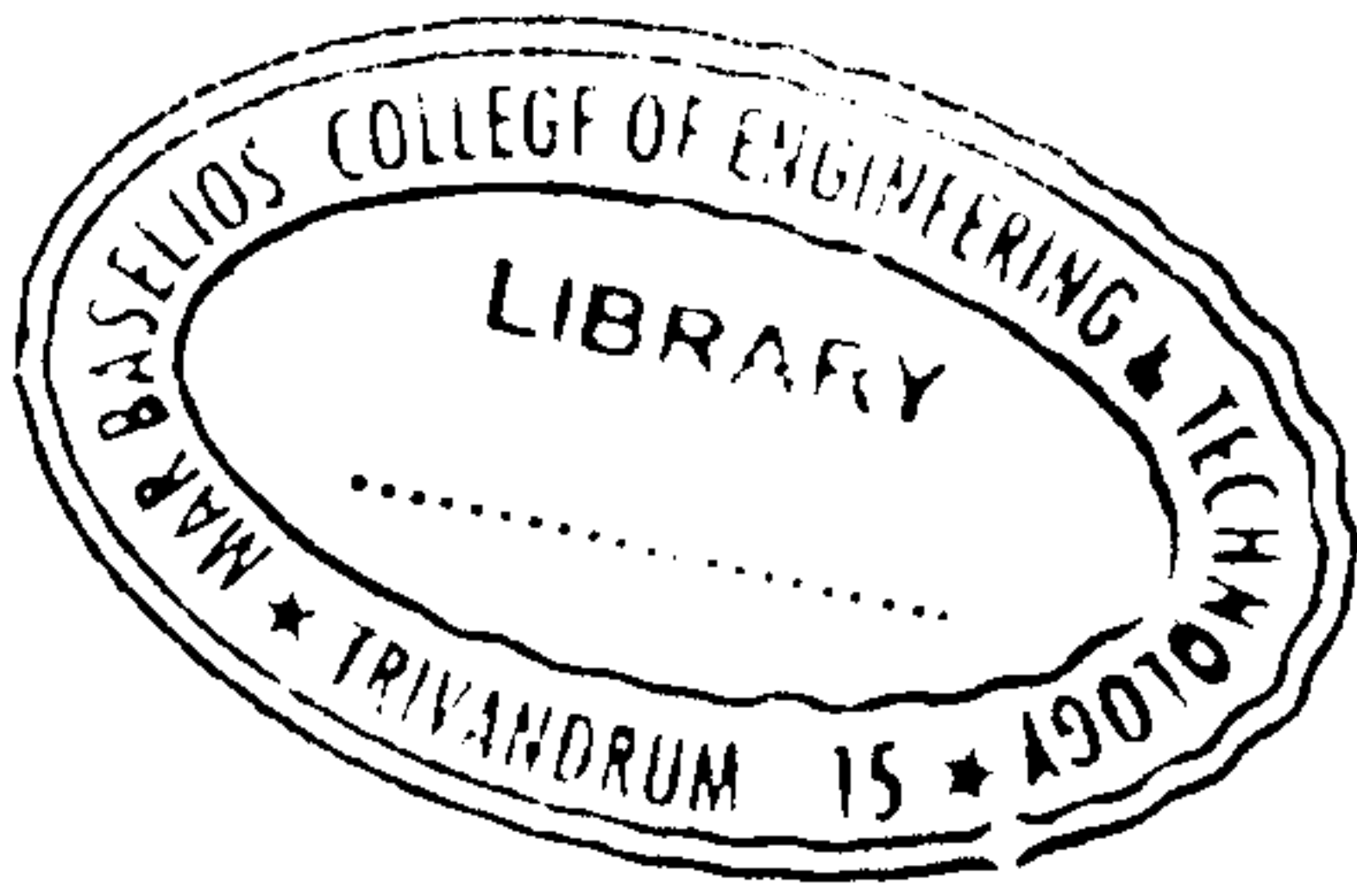
Answer **all** questions. Each question carries **4** marks.

1. What are the important properties of OIC substrate materials?
2. List the important types of waveguide structures used in integrated optics.
3. Explain the strip loaded wave guide.
4. Differentiate between intrinsic and extrinsic fiber optic sensors.
5. Explain the principle of electro optic modulator.
6. Draw the side view of a slab waveguide showing wave normal of the Zig-Zag waves corresponding to a guided mode.
7. Explain an integrated optical detector.
8. Explain the relationship between coupling coefficient and the spacing between the waveguide.
9. Explain how a doped fiber can act as an optical amplifier.
10. Explain micro optical devices.

**(10 × 4 = 40 marks)**

P.T.O.





## PART B

Answer **any two** questions from each module. Each question carries **10** marks

### Module I

11. Discuss different modes in a planar waveguide and illustrate optical ray pattern within a multimode planar waveguide.
12. Explain
  - (a) Carrier concentration reduction wave guides
  - (b) Electro optic waveguide
13. (a) Compare Hybrid and Monolithic Optical Integrated circuits.  
(b) What are the important Characteristics of an Optical waveguide?

**(2 × 10 = 20 marks)**

### Module II

14. Discuss the applications of Polymer wave guides. How the polymer processing is carried out.
15. Explain the lasing action of a semiconductor laser. How integrated lasers are fabricated.
16. Explain the structure of a dual channel electro optical modulator with neat diagrams.

**(2 × 10 = 20 marks)**

### Module III

17. Give the working principle of Fiber Raman amplifier. Draw necessary diagrams.
18. With a block schematic explain a homodyne coherent detection System. How the sensitivity can be increased locally?
19. With block schematic explain the soliton light wave system also explain how the pulse shape is preserved?

**(2 × 10 = 20 marks)**

