

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019****Subject Code: 2173904****Date: 03/12/2019****Subject Name: Photonics****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

|     |     |                                                                                                                | MARKS |
|-----|-----|----------------------------------------------------------------------------------------------------------------|-------|
| Q.1 | (a) | What is Electroluminescence? Write its Applications.                                                           | 03    |
|     | (b) | Write Short note on Nanobiophotonics.                                                                          | 04    |
|     | (c) | Write Applications of Optical Fiber.                                                                           | 07    |
| Q.2 | (a) | Describe Applications of Photo-Detectors.                                                                      | 03    |
|     | (b) | Explain Working of P-N Junction Solar cells.                                                                   | 04    |
|     | (c) | Explain Photonic Crystals.                                                                                     | 07    |
| OR  |     |                                                                                                                |       |
|     | (c) | Explain Working of Rubby laser and mention its Applications.                                                   | 07    |
| Q.3 | (a) | Define Photonic Band Gap.                                                                                      | 03    |
|     | (b) | Explain Radiation Pressure.                                                                                    | 04    |
|     | (c) | Write and Explain Maxwell's Equations for Vacuum and Matter.                                                   | 07    |
| OR  |     |                                                                                                                |       |
| Q.3 | (a) | What is E-k Diagram What does it Signifies?                                                                    | 03    |
|     | (b) | Write a Short note on Laser Surgery.                                                                           | 04    |
|     | (c) | Describe Electro Optic and Magneto Optic Devices.                                                              | 07    |
| Q.4 | (a) | What is Double Refraction?                                                                                     | 03    |
|     | (b) | What is polarizer?                                                                                             | 04    |
|     | (c) | Explain Working of He-Ne Laser and Mention its Applications.                                                   | 07    |
| OR  |     |                                                                                                                |       |
| Q.4 | (a) | Describe Faraday Effect.                                                                                       | 03    |
|     | (b) | Explain the Terms - Polarization of light, Interference of light, Dispersion of light and Modulation of light. | 04    |
|     | (c) | Explain Behavior of Electromagnetic Wave in different Media.                                                   | 07    |
| Q.5 | (a) | Describe Electro-Optic Kerr Effect.                                                                            | 03    |
|     | (b) | Write note on Opto-Electronic Tweezers.                                                                        | 04    |
|     | (c) | Compare Three Level and Four Level Laser Systems. Which is Better and Why?                                     | 07    |
| OR  |     |                                                                                                                |       |
| Q.5 | (a) | Give Applications of Faraday Effect.                                                                           | 03    |
|     | (b) | Write a Short note on Plasmon.                                                                                 | 04    |
|     | (c) | Write Applications of Laser.                                                                                   | 07    |

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