

I/IV B. TECH. DEGREE EXAMINATIONS, NOV / DEC - 2015**First Semester****BT / CSE / ECE / EEE****ENGINEERING PHYSICS - I**Time : **Three Hours**Maximum Marks : **60****Answer Question No. 1 Compulsory.****12x1=12 M****Answer ONE question from each Unit.****4x12=48 M**

1. Write the following in brief.

- a) What are important conditions for interference of light ?
- b) What is Echo ?
- c) What is radius of curvature ?
- d) What is stimulated emission ?
- e) What is the basic principle of Holography ?
- f) Why Gas lasers are better than Ruby laser ?
- g) What is the principle of propagation of light in an optical fibre ?
- h) What is acceptance angle ?
- i) What is electric flux ?
- j) What is meant by displacement current ?
- k) What is the resonance condition in series LCR circuit ?
- l) State Lenz's law.

UNIT - I

2. a) Explain principle, construction and working of Piezoelectric oscillator for the production of ultrasonic waves.
- b) Write applications of pulse echo technique.

(OR)

3. a) Describe the construction and working of He-Ne laser and Give applications of Lasers.
- b) Explain structure of optical fiber.

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UNIT - II

4. a) Discuss the qualitative description of Fraunhofer diffraction of light at single slit.
- b) Explain phenomena of double refraction.

(OR)

5. a) Describe the construction and working of Nicol prism and explain how Nicol prism can be used as polarizer and analyzer.
- b) What is quarter wave plate ? Deduce its thickness for a given wavelength in terms of its refractive indices.

UNIT - III

6. a) Explain population inversion.
- b) Describe the construction and working of He-Ne laser.

(OR)

7. a) What is numerical aperture ? Derive an expression for Numerical aperture of optical fiber.
- b) Discuss applications of optical fibres in various fields.

UNIT - IV

8. a) State and explain Gauss's in magnetism.
- b) Discuss the concept of displacement current. Distinguish between conduction current and displacement current.

(OR)

9. a) Write four Maxwell equations in integral form.
- b) Derive the wave equation for electromagnetic fields using Maxwell's electromagnetic equation and hence show that the velocity of electromagnetic wave in free space is

$$\frac{1}{\sqrt{\mu_0 \epsilon_0}}$$

