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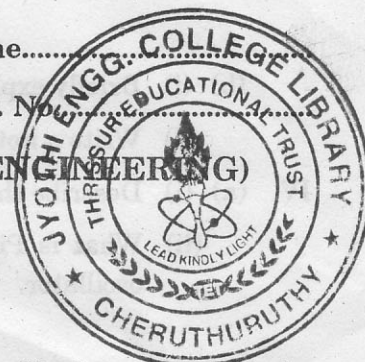
Name.....

Reg. No.....

**COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)
DEGREE EXAMINATION, MAY 2011**

EN 04 103 B—ENGINEERING PHYSICS (B)

(For CH, CE, ME, PE, AM)



Time : Three Hours

Maximum : 100 Marks

Part A

- I. (a) Distinguish between Fresnel and Fraunhofer diffraction.
- (b) Define dispersive power of a grating and show that it is directly proportional to number of lines per cm.
- (c) Derive Bragg's law for X-ray diffraction.
- (d) Explain the properties of LASER.
- (e) Describe the use of ultrasonic in NDT.
- (f) Discuss the methods to measure the absorption coefficients of materials in a room.
- (g) Distinguish between *n*-type and *p*-type semiconductors.
- (h) Describe the principle and working of LED.

(8 × 5 = 40 marks)

Part B

- II. (a) (i) Develop the theory for positions of maximum and minimum intensity for the diffraction pattern due to a straight edge.

(10 marks)

- (ii) What is an air wedge ? How can it be used to determine the thickness of a hair ?

(5 marks)

Or

- (b) (i) Describe the construction and working of a Nicol prism. (8 marks)

- (ii) What are quarter wave and half wave plates ? Describe their applications. (7 marks)

- III. (a) (i) Describe the cubic system and the terms associated with it. (8 marks)

- (ii) Derive an expression for spacing between lattice planes in the cubic structure.

(7 marks)

Or

Turn over

- (b) (i) Briefly explain the construction and working of He-Ne Laser. (10 marks)
- (ii) Write a note on the industrial applications of lasers. (5 marks)
- IV. (a) (i) Describe the construction and working of a rotary vane pump. (5 marks)
- (ii) What is Piezoelectric effect ? Explain the production of ultrasonics and piezoelectric oscillator. (10 marks)

Or

- (b) (i) What is the principle behind magnetic particle testing ? (4 marks)
- (ii) Explain the terms (1) Decibel ; (2) phon. (6 marks)
- (iii) What are factors that influence the acoustic properties of a building ? (5 marks)
- V. (a) (i) Define Fermi energy level. Where would you expect its position in (1) n-type semiconductor (2) p-type semiconductor ? (6 marks)
- (ii) Explain the working of a transistor in common emitter configuration with its characteristics. (9 marks)

Or

- (b) (i) Describe the basic principle of optical fibers with suitable diagrams. (4 marks)
- (ii) Distinguish between step index and graded index fiber. (6 marks)
- (iii) Draw the block diagram of an optical fiber communication system. What are its advantages ? (5 marks)
- [4 × 15 = 60 marks]