C 31699

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Name..

Reg. No...

COMBINED FIRST AND SECOND SEMESTER B.TECH (ENGINEERING) DEGREE EXAMINATION, JUNE 2007

EN 04 103 A—ENGINEERING PHYSICS (A)

(For AI, CS, EE, EC, IT, IC, BM, BT, PT)

[2004 admissions]

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Section A

I. 1 What is a transistor ? Explain the operation of PNP transistor.   (5 marks)

2 Explain the theory of Dic Josephson's effect.   (5 marks)

3 Derive the condition to get the bright fringes of interference pattern due to transmitted light.

(5 marks)

4 Distinguish between Fresnels and Fraunhofer class of diffractions.   (5 marks)

5 List out the properties of Laser.   (5 marks)

6 Distinguish between Single mode and Multi-mode fibres with suitable diagram.   (5 marks)

7 Define the Absorbing power, Reflecting power and Transmitting power of a black body.

(5 marks)

8 Write short notes on piezoelectric effect.   (5 marks)

(8 × 5 = 40 marks)

Section B

II. (i) (a) Discuss the avalanche and breakdown voltage of zener diode and also discuss the zener diode as a voltage regulator.

(12 marks)

(b) Write a short note on solar cells.

(3 marks)

Or

(ii) (a) Explain : (i) BCS theory ; (ii) SQUID.

(10 marks)

(b) Derive the Hall-coefficient.

(5 marks)

III. (i) (a) How will you find the thickness of a thin wire using air wedge method ?

(10 marks)

(b) Discuss the testing of optical planeness of surfaces.

(5 marks)

Or

Turn over

(ii) (a) Explain the construction and working of diffraction grating.

(12 marks)

(b) Describe Rayleigh's criteria. (3 marks)

IV. (i) (a) Explain the construction and working of half shade polarimeter. Discuss few applications of it.

(10 marks)

(b) Derive an expression for the ratio of spontaneous and stimulated emissions. (5 marks)

Or

(ii) (a) Explain the Fibre optic communication system with a neat block diagram and give its advantages over the conventional system.

(12 marks)

(b) Explain the applications of Laser in medical field.

(3 marks)

V. (i) (a) Derive the Planck's Law of radiation.

(12 marks)

(b) Find the lowest energy of electron confined in a box of 0.1 nm each side. (3 marks)

Or

(ii) (a) Explain the ultrasonic diffractometer with neat diagram. How will you determine the velocity of ultrasonics in a liquid ? (15 marks)

[4 × 15 = 60 marks]