Reg. No. :

Question Paper Code : 97139

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

First Semester

Civil Engineering

PH 6151 — ENGINEERING PHYSICS — I

(Common to all Branches)

(Regulation 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between crystalline material and amorphous material.

2. Define miller indices.

3. Name the factors which affect the elasticity of a body.

4. Define thermal conductivity.

5. State the Weins displacement law.

6. What is the advantage of electron microscope over ordinary microscope?

7. Define sound absorption co-efficient of a material.

8. Mention four applications of ultrasonic waves.

9. What   mean by population inversion?

10. What   ses of optical fibers?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Show that the packing density of FCC and HCP structures are equal. (8)

    (ii) Explain the physical basis of classifying crystals into seven systems and 14 Bravais lattices. (8)

Or

(b) State the principle and illustrations of (i) Czochralski's technique (ii) Bridgman Technique for material preparation. (8 + 8)

12. (a) Derive an expression for the depression of cantilever at a distance X from the fixed end loaded at its free end, neglecting the mass of cantilever. (16)

Or

(b) (i) Describe Lees' method for determining the thermal conductivity of glass. (8)

    (ii) Derive an expression for the flow of heat through the compound media. (8)

13. (a) Explain Compton effect and its physical significance. Derive the relations giving the change of wavelength, the energy of recoil electron and recoil angle. What is Compton shift? (16)

Or

(b) Derive Shrodinger's (i) time independent and (ii) time dependent equations for matter waves. (8 + 8)

14. (a) Explain in detail the acoustic demands of a hall. (16)

Or

(b) What is ultrasonics? Explain the magnetostriction method of producing ultrasonic waves and hence describe its advantages over the piezoelectric method. (2 + 10 + 4)

15. (a) (i) Explain what do you mean by laser emission? What are the conditions to achieve it. (2 + 4)

    (ii) Give the principle of CO_2 laser and explain its working by an energy level diagram. (10)

Or

(b) Explain the propagation of light through optical fibers and explain the different types of fibers. (8 + 8)

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