C 3360

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

First Semester

(Regulation 2004)

Civil Engineering

PH 1101 — PHYSICS — I

(Common to all Branches)

Time : Three hours Maximum : 100 mark

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Weber — Fechner law.

2. What is meant by absorption coefficient? Mention its units.

3. What are Bravais lattices?

4. What are Miller indices?

5. What is a quarter wave plate?

6. State Stress — optic law.

7. Write Planck' s radiation formula.

8. State the physical significance of wave function.

9. What are the characteristics of lasers?

10. Calculate the Numerical Aperture of an Optical Fiber whose core and cladding are made of materials of refractive index 1.6 and 1.5 respectively.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define the term 'reverberation time'. (4)

(ii) Derive Sabine's formula for reverberation time. (12)

Or

(b) (i) What is Piezo-electric effect? (4)

(ii) Describe the Piezo electric method of producing Ultrasonic waves. (12)

12. (a) (i) Define the terms "Atomic radius" and "Atomic Packing factor". (4)

(ii) Calculate the Atomic Packing factor for BCC and FCC structures. (12)

Or

(b) (i) Distinguish between X-ray radiography and fluoroscopy. (4)

(ii) Describe the working of Ultrasonic flaw detector for NDT. (12)

13. (a) Describe the construction and working of Michelson's Interferometer and mention its applications. (16)

Or

(b) Discuss in detail how Plane and Circularly polarised light can be produced and analysed. (16)

14. (a) Explain the Compton effect and derive an expression for the wave length of scattered photon. (16)

Or

(b) Derive the Time Independent Schrödinger equation for a One dimensional motion. Use it to prove that a particle enclosed in a One dimensional box has quantised energy values. (16)

15. (a) (i) Explain the modes of vibrations of CO_2 molecule. (4)

(ii) Describe the construction and working of CO_2 laser. (12)

Or

(b) (i) Distinguish between the Step Index and Graded Index Fiber. (4)

(ii) Derive an expression for Numerical Aperture and Acceptance angle in an Optical Fibers. (12)
