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T 3515

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

First Semester

(Regulation 2004)

Civil Engineering

PH 1101 — PHYSICS — I

(Common to all branches of B.E./B.Tech.)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Determine the increase in acoustic intensity level when the sound intensity is doubled.
2. Outline the principle of SONAR.
3. What is called the unit cell of a crystal?
4. What is the principal of X – ray fluoroscopy in NDT?
5. What are anti- reflection coatings?
6. Define photoelastic effect.
7. What is Compton effect?
8. Mention the physical significance of wave function.
9. What is the important difference between ordinary light and laser?
10. Define the numerical aperture of an optical fiber.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the different factors affecting the acoustic quality of an auditorium and hence discuss the respective remedial measures. (16)

Or

- (b) (i) With a neat diagram, discuss the principle and the method of production of ultrasonic waves by piezoelectric method. (12)
- (ii) List the properties of ultrasonic waves. (4)

12. (a) (i) Derive the relation between interplanar distance of a given (hkl) plane and the lattice parameter of a cubic crystal. (4)
- (ii) Deduce the (c/a) ratio and hence the atomic packing factor of a HCP crystal. (12)

Or

- (b) Explain (i) liquid penetrant method and (ii) ultrasonic flaw detector in NDT. (8 + 8)

13. (a) Explain the theory of air wedge and an experimental procedure to determine the thickness of a thin object using it. (16)

Or

- (b) Discuss the theory of plane, circularly and elliptically polarized light. (16)

14. (a) Discuss the theory of blackbody radiation in detail and derive the intensity – wavelength relation. (16)

Or

- (b) Discuss the theory of particle-in-a-box problem and explain the results. (16)

5. (a) With necessary energy level scheme, explain the working of a CO₂ laser. (16)

Or

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- (b) (i) Discuss the working of a pressure sensor and of a temperature sensor using optical fibers. (5 + 5)
- (ii) Outline the working of a fiber optic communication system. (6)
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