Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 21042

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

First Semester

Civil Engineering

PH 6151 — ENGINEERING PHYSICS – I

(Common to : All branches)

(Regulations 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are lattice parameters?

2. Draw the crystal planes with miller indices (101) and (100).

3. Define stress and strain with units.

4. What are the modes of heat transfer?

5. Define Compton shift.

6. Give the physical significance of the wave function.

7. How do you classify the sound waves with frequency?

8. What is Echelon effect?

9. What is the principle of laser?

10. A signal of 100 mW is launched into a fiber. The out coming signal from the other end is 50 mW. What is the loss in dB?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define Atomic packing factor and derive it for face centered cubic structure. (8)

    (ii) Write short notes on Diamond and Graphite. (8)

Or

    (b) (i) Calculate the interplanar distance for the miller indices (321) in simple cubic lattice with interatomic spacing equal to 4.12Å. (4)

    (ii) Explain the Czochralski method of crystal growth. (12)

12. (a) (i) How the temperature and impurity factors are affecting the elasticity of the materials. (4)

    (ii) Derive an expression for depression at the free end of a cantilever due to load. (12)

Or

    (b) Derive the equation for heat conduction along an infinite long bar and solve it for steady state condition. (16)

13. (a) Derive Planck's Black body radiation formula and deduce Wien's displacement law and Rayleigh-Jean's law. (16)

Or

    (b) Solve the Schrodinger time independent wave equation for a particle in one dimensional box and calculate the Eigen values and Eigen functions. (16)

14. (a) Derive Sabines theory to explain the growth of sound energy in a room. (16)

Or

    (b) (i) Explain the acoustic grating method to determine the velocity of ultrasonic waves in liquid. (8)

    (ii) Explain A-scan technique in NDT to locate a defect in a metal piece. (8)

15. (a) Discuss the construction and working of a Nd: YAG laser and its uses. (16)

Or

    (b) (i) List out the advantages of fiber optics communication. (8)

    (ii) Write notes on fiber optic endoscopy. (8)

2   21042