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**Question Paper Code : 72383**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

First Semester

Civil Engineering

PH 6151 — ENGINEERING PHYSICS — I

(Common to all branches)

(Regulations 2013)

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Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a unit cell?
2. Lattice constant of a BCC crystal is 0.36 nm. Find its atomic radius.
3. What are the types of Moduli of elasticity?
4. Define thermal conduction.
5. State Compton effect.
6. What is the basic principle in transmission electron microscope?
7. Define reverberation time.
8. What is SONAR?
9. What is an optical fiber?
10. What are the applications of Nd-YAG laser?

PART B — (5 × 16 = 80 marks)

11. (a) What are Miller indices? Derive an expression for the interplanar spacing (hkl) planes of a cubic structure.

Or.

- (b) Explain the following structures :

(i) Diamond

(10)

(ii) Graphite

(6)

12. (a) Derive an expression for the elevation at the centre of a beam which is loaded at both ends. Describe an experiment, to determine the Young's modulus of a beam loaded at both ends in detail.

Or

- (b) Describe with relevant theory the method of determining the co-efficient of thermal conductivity of a bad conductor by Lee's disc method.

13. (a) Explain G.P. Thomson experiment to prove the wave nature of an electron.

Or

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- (b) What is the principle of an electron microscopy? Draw the construction of an electron microscope and explain its working. Compare it with optical microscope.

14. (a) What are the factors affect the acoustics of a building? Explain each factor along with its remedy

Or

- (b) (i) What is acoustic grating? Describe the method of determining the velocity of ultrasonic waves using acoustic grating (12)  
(ii) Mention any four applications of ultrasonic waves. (4)

15. (a) Explain how laser action is achieved in homojunction and heterojunction Ga-As laser with suitable diagrams.

Or

- (b) Write short notes on :

- (i) Endoscope (8)  
(ii) Fibre optic - displacement sensor. (8)

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