Reg. No. | | | | | | | | | | | | |

Question Paper Code : 57698

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

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. Write down the relation between atomic radius and lattice parameter of HCP.
2. Why is diamond called as loosely packed system ?
3. What is bending beam moment ?
4. Define coefficient of thermal conductivity.
5. Calculate the de Broglie wavelength associated with an electron having energy of 100 keV.
6. In an infinite square well potential, the energy eigen values are quantized. Why ?
7. Suppose a single violin produced 60 dB of sound intensity level, calculate the effective sound intensity level of 8 such violins.
8. What are the properties of ultrasonic waves ?
9. What do you mean by population inversion ?
10. Distinguish between step index and graded index fibers.

PART – B (5 × 16 = 80 Marks)

11. (a) Define the terms Atomic radius and Packing factor.

Calculate the above for SC, BCC and FCC structures.

OR

(b) Describe Bridgmann and Czochralski methods of crystal growth and compare their salient features.

12. (a) Derive the expression for the Young's modulus of an uniform bending of a rod and describe the experiment to determine the Young's modulus of that rod using this method.

OR

(b) Derive a differential equation (second order) to describe the heat conduction along a uniform bar. Hence, obtain the steady state solution of it.

13. (a) Explain Compton effect. Derive an expression for Compton shift of wavelength. Describe Compton experiment.

OR

(b) What is the principle of transmission electron microscope ? Draw the construction of transmission electron microscope and explain its working. Give its advantages, disadvantages and applications.

14. (a) Obtain Sabine's expression for reverberation in a hall.

OR

(b) (i) Explain with neat diagram, principle, construction, working of magnetosriction method to produce ultrasonics. **(12)**

(ii) Explain the uses of ultrasonics in non-destructive test. **(4)**

15. (a) Describe the construction and working of CO_2 laser with neat diagram and write down its applications. **(16)**

OR

(b) (i) Obtain the expression for numerical aperture of an optical fiber. **(10)**

(ii) Explain the importances of fiber optic communications. **(6)**
