

Roll No.

--	--	--	--	--	--	--	--

B.E. / B.Tech. Degree End Semester Degree Examination, April/May 2011

First Semester

**PH 9111 ENGINEERING PHYSICS
(Common to all Branches)**

(Regulation 2008)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What is the effect of temperature on elasticity?
2. What is the importance of safety factor in designing engineering structures?
3. What is inverse piezo electric effect?
4. A lecture hall of volume $12 \times 10^4 \text{ m}^3$ has a total absorption of 13200 m^2 of O.W.U. Entry of people into the hall raises the absorption by another 13200 m^2 of O.W.U. Find the change in the reverberation time.
5. What is meant by thermal stress?
6. State carnot's theorem?
7. What are einsteins coefficients A and B in laser.
8. Why are antireflection coatings given?
9. X-rays of unknown wavelength give first order Bragg reflection at glancing angle 20° with (212) planes of copper having FCC structures. Find the wavelength of x-rays, if the lattice constant for copper is 3.615 \AA .
10. Distinguish between Frenkel and schottky defects.

Part - B (5 x 16 = 80 marks)

11. (i) Show that when a cylinder is twisted the torsional couple per unit angular twist is $\frac{\pi N a^4}{2l}$ where the symbols have their usual meanings. 12
(ii) Calculate the energy stored during twisting a wire through 60° . The rigidity modulus, radius and length are 10^{12} Pa , 1 mm and 1 m respectively. 4
12. a) What is piezo-electric effect? Explain with neat circuit, the generation of ultrasonic using a piezo- electric oscillator.
OR
b) What is reverberation time? Derive an expression for growth and decay of sound energy inside a hall.

13. a) Describe the cycle of operations involved in an ideal Otto engine along with its efficiency.

OR

- b) Describe the forbe's method to determine the thermal conductivity of good conductor.

14. a) (i) Explain the construction, types of fringes and applications of Michelson's interferometer. 12

(ii) Monochromatic light emitted by a broad source of wavelength 580 nm, falls normally on two plates of glass enclosing a wedge shaped film. The plates touch at one end and are separated at a point 15 cm from that end by a wire of 0.05 mm diameter. Find the fringe width. 4

OR

- b) Explain the construction and working of Nd: YAG laser with its energy level diagram.

15. a) (i) Show that the FCC structures possesses least percentage of void space among SC, BCC and FCC cubic structures. 12

(ii) Determine lattice constant for FCC lead crystal of radius 1.746 Å. Also find the spacing of (i) 111 plane (ii) 200 plane and (iii) 220 plane. 4

OR

- b) Describe with suitable diagram edge dislocation and screw dislocation in crystal lattice. What is Burger's vector?