



B.E. / B.Tech. Degree End Semester Degree Examination, April/May 2012

First Semester

PH 171 PHYSICS I

(Common to all Branches)

(Regulation 2004)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What is meant by Echelon effect?
2. Calculate the amplitude of vibration of the air particle for a note of frequency 1000Hz and with minimum intensity of audibility. Given that the minimum intensity of audibility is 10^{-12} Wm^{-2} , density for air is 1.29 Kg m^{-3} , velocity of sound is 340 ms^{-1} .
3. Draw the crystal planes with miller indices 111 and 101?
4. What are the disadvantages of liquid penetrant method of NDT?
5. What are the applications of Michelson interferometer?
6. What is photoelasticity?
7. What is quantum theory of light?
8. What is de broglie wavelength?
9. What are the characteristics of laser radiation?
10. What are the conditions for total internal reflections?

Part - B (5 x 16 = 80 marks)

11. (i) Discuss in detail the principle, construction and working of piezoelectric method of production of ultrasonic waves.
(ii) a quartz crystal of thickness 0.001 m is vibrating at resonance. Calculate the fundamental frequency of it. (young's modulus of quartz is $9 \times 10^{10} \text{ N/m}^2$ and its density is 2650 kg/m^3)
12. a) Show that the packing factor for Face Centred Cubic and Hexagonal Close Packed structures are same.

OR

b) Describe the working of ultrasonic flaw detector for non destructive testing. Mention its advantages and disadvantages..

13. a) Describe the air wedge experiment to determine the thickness of a paper. Also explain the determination of the flatness of a glass surface.

OR

b) Describe the production of the plane, circular and elliptical polarized light. How these lights are analysed.

14. a) Explain the application of Schrodinger wave equation to one dimensional potential well. Outline the characteristics of the wave function.

OR

b) Explain Compton effect and derive an expression for the wavelength of scattered photon.

15. a) Discuss the various types of optical fibers. Explain any one application of fiber as a sensor.

OR

b) Describe the principle, construction and working of a He-Ne laser with suitable energy level diagram.