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B.E.Tech. (Full Time) End Semester DEGREE EXAMINATION, NOV / DEC 2011

First Semester

PH 171 PHYSICS I

(Regulation 2004)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define intensity of sound .What is its unit?
2. What is meant by echelon effect?
3. Calculate the inter planar distance for (321) plane.
4. Draw the crystal planes with miller indices (100).
5. Why antireflection coatings are given?
6. What is Polarimeter?
7. State Wien's displacement law.
8. What is the physical significance of the wave function?
9. Define spontaneous emission and stimulated emission?
10. Define numerical aperture of a fiber.

Part - B (5 x 16 = 80 marks)

11. (i) What are ultrasonic waves? Explain with neat circuit diagram the generation of ultrasonic waves using piezo electric oscillator.
(ii) Calculate the fundamental frequency of a quartz crystal of thickness 1mm. Given young's modulus of the material of the crystal is 7.9×10^{10} N/m² and density of the material is 2650 kg/m³.
12. a) Show that the packing factor for FCC and HCP structures is equal.
OR
b) (i) Explain the liquid penetrant method of non destructive testing
(ii) What are the advantages of this method over x-ray radiography method?
13. a) Derive an expression for the diameter of a thin wire in Air-wedge experiment and describe the experiment to determine the diameter?
OR
b) Discuss the production and analysis of different types of polarized light.
14. a) Explain the Compton effect and derive an expression for the wavelength of the scattered photon.

OR

- b) Discuss the case of particle in a box based on Schrödinger wave equation. Apply this to electrons in a metal.
15. a) What are the different types of fiber optical sensors? Explain the working of any two sensors.

OR

- b) Describe the construction and working of He-Ne laser. What are its applications?