SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E/ B. Tech – MECH/M&P/CIVIL/AERO/ CHEM/BIN/BTE/BME
Title of the paper: Engineering Physics
Semester: II — Max. Marks: 80
Sub.Code: 6C0018 (2006/2007) — Time: 3 Hours
Date: 16-05-2008 — Session: FN

PART – A (10 x 2 = 20)

Answer All the Questions

1. What is Joule-Thomson effect?
2. What is magneto-caloric effect?
3. State stress-optic law.
4. Define the terms: plane of polarization and optic axis.
5. Distinguish between A-scan and B-scan.
6. What is magnetostriction effect?
7. List the advantages of fluoroscopy.
8. Give the principle of photomultiplier.
9. Sodium has BCC structure and its atomic number is 0.1278 nm. Calculate the inter-planar spacing for (112) planar spacing for (112) plane and volume of unit ceil.
10. What are Miller indices? How can you find the Miller indices of a plane?

PART – B (5 x 12 = 60)

Answer All the Questions

11. (a) Describe the experimental arrangement of Pictet's cascade process for the liquefaction of Oxygen. (8)
    (b) Give the result of Porous Plug experiment. (4)

(or)

12. Describe the principle and working of a refrigerator with diagram and obtain its COP.

13. (a) Explain the production and detection of plane and circularly polarized lights. (9)
    (b) Draw the schematic diagram of a photo-elastic bench. (3)

(or)

14. Describe the theory of photo-elasticity for a stressed model under a plane polariscope and discuss the types of fringes obtained.

15. (a) With principle and neat circuit diagram describe the working of piezoelectric ultrasonic generator. (10)
    (b) Calculate the frequency of first overtone emitted by piezoelectric oscillator. (2)

(or)

16. What is Doppler effect? With neat block diagram explain how Doppler effect is used in ultrasonics to measure the blood flow?

17. (a) Explain the principle behind radiography with schematic diagram. (4)
    (b) Explain how X ray radiography technique is used in diagnostic purpose. (8)

(or)

18. With neat figure explain how the gamma camera is acting as a medical imaging device.

19. (a) Derive the relation between interplanar distance and lattice constant of a cubic lattice. (4)
    (b) Describe the structure of hcp crystal with neat figure and calculate its density of packing. (8)

(or)

20. (a) Explain with neat sketch the structure of bcc and fcc crystals. Calculate the packing density. (9)
    (b) Polonium crystalises into simple cubic. The atomic weight of polonium is 209 and density is 9400 kg/m^3. Find the lattice constant. (3)