

SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act,1956)

Course & Branch :B.E/B.Tech - AERO/CSE/EIE/IT/M&P/MECH

Title of the Paper :Applied Physics – I

Max. Marks :80

Sub. Code :4ET103-5ET103

Time : 3 Hours

Date :07/12/2009

Session :FN

PART - A

(10 x 2 = 20)

Answer ALL the Questions

1. Define coefficient of thermal conductivity.
2. Is there any heat conduction through vacuum?
3. Interference fringes are produced with monochromatic light falling normally on a wedge shaped air film. The angle of the wedge is 40 seconds of an arc and the distance between the successive fringes is 0.125 cm. Calculate the wavelength of the light.
4. What is a half wave plate?
5. A class room has dimensions 4 x 6 x 10 m and has a reverberation time of 1.6 seconds. What is the total absorption made by the class room?
6. What is magnetostriction effect?
7. State Newton's law of gravitation.
8. Define Hooke's law.
9. Calculate the de-Broglie wavelength of an electron accelerated by a potential difference of 150 V.
10. List the properties of X-rays.

PART – B

(5 x 12 = 60)

Answer All the Questions

11. Describe with necessary theory with an experiment to determine the thermal conductivity of a bad conductor.
(or)
12. (a) State and explain Kirchhoff's law of heat radiations. (8)
(b) State Stefan's law. Give its proof. (4)
13. Deduce an expression for air-wedge to find the thickness of a thin sheet of paper and hence explain an experimental method to find the thickness of a thin sheet of paper using air – wedge experiment.
(or)
14. Explain in detail the production and analysis of plane, circularly and elliptically polarized lights.
15. Describe the rate of growth and rate of decay of sound in an auditorium and derive Sabine's formula for reverberation time.
(or)
16. What is Piezoelectric effect? Explain with a neat circuit, the generation of ultrasonics using a Piezo-electric oscillator.
17. Derive expressions for gravitational field at a point
(a) inside (b) outside (c) on the surface of a spherical shell.
(or)
18. Derive the expressions for moment of inertia of the disc and rigidity modulus of a cylindrical wire using torsional pendulum.
19. Discuss de-Broglie theory of matter waves and explain the experiment of Davisson and Germer on electron diffraction.
(or)
20. Discuss about the theory and experimental verification of Compton effect.