SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E/B.Tech – CSE/IT/MECH/M&P/E&C/EIE/ CIVIL/BIN/AERO
Title of the paper: Applied Physics - I
Semester: I — Max. Marks: 80
Sub.Code: ET103/4ET103/5ET103 — Time: 3 Hours
Date: 04-12-2008 — Session: FN

PART – A (10 x 2 = 20)

Answer All the Questions

1. Define the mode of heat transfer – Conduction.
2. State Kirchoff's law for radiation.
3. Mention the condition for interference of light.
4. What do you mean by quarter wave plate?
5. The intensity of the sound is 4×10^{-3} Watt/m^2. Calculate the sound intensity level in dB.
6. List the demerits of Piezoelectric oscillator.
7. Explain the terms gravitational field and potential.
8. Give the relation between three module of elasticity and Poisson's ratio.
9. Obtain the de Broglie equation relating wave and particle nature.
10. Why X-rays are not diffracted by optical transmission grating?

PART – B (5 x 12 = 60)

Answer All the Questions

11. (a) Describe Forbe's method to determine the coefficient of thermal conductivity of good conductor. (9)
    (b) What are the advantages and disadvantages of Forbes's method of determining thermal conductivity of good conductors? (3)

(or)

12. (a) Mention the properties of thermal radiation. (5)
    (b) Discuss in detail disappearing filament pyrometer. (7)

13. (a) Describe air wedge method of finding thickness of thin paper. (9)

(b) A paper of 50 micrometer thick is used to form interference in an airwedge with a light of wavelength 589.3nm. Calculate the bandwidth of fringes formed, if the length of airwedge is 7cm. (3)

(or)

14. (a) Distinguish between unpolarised and polarized light. (3)

(b) Discuss in detail how plane, elliptical and circularly polarized light can be produced and analyzed. (9)

15. (a) Derive Sabine's formula for reverberation time. (10)

(b) A cinema hall has volume of $7500m^3$. What should be the total absorption in the hall if the reverberation time of 1.5 second is to be maintained? (2)

(or)

16. (a) Explain with neat circuit the generation of ultrasonics waves using magnetostricition method. (8)

(b) Write down the principle of SONAR. (4)

17. (a) Discuss the determination of mass and mean density of earth.

(b) Explain the variation of acceleration due to gravity due to latitude and altitude.

(or)

18. (a) Define elastic limit of a body. (2)

(b) Discuss the theory of torsion pendulum and its application to obtain the rigidity modulus of a wire. (10)

19. (a) Outline the characteristics of wave function. (3)

(b) Explain the application of schroedinger's wave equation to one dimensional potential well. (9)

(or)

20. (a) Explain Compton effect and derive an expression for the wavelength of scattered photon. (8)

(b) Briefly discuss the origin of X-rays. (4)