SATHYABAMA UNIVERSITY
(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E/ B.Tech – (Common to ALL Branches)
Title of the paper: Applied Physics

Semester: I   Max. Marks: 80
Sub.Code: 6C0003   Time: 3 Hours
Date: 06-05-2007   Session: FN

PART – A   (10 x 2 = 20)
Answer ALL the Questions

1. What is convection of heat?
2. Two bars of copper and steel of lengths 1.5 m and 1 m and coefficient of thermal conductivity 400 W/m/K and 50 W/m/K respectively and equal cross section are joined end to end. The free ends of copper and steel are maintained at 110°C and 30°C respectively. Calculate the temperature at the junction.
3. What is depth of focus of a photographic camera?
4. It is desired to make a achromatic lens of mean focal length 20 cm by using two lenses. If the dispersive powers are in the ratio 1:2, find the focal length of each lenses.
5. Define the terms: intensity and intensity level.
6. What is absorption coefficient? Give its unit.
7. Write a short note on bending moment of a beam.
8. 'In a cantilever setup if the length of cantilever is doubled, the depression gets increased by 8 times'. Justify this statement.
9. Give the properties of matter waves.
10. Find the lowest energy of an electron confined in a one dimensional box of side 0.1 nm.

PART – B   (5 x 12 = 60)
Answer All the Questions

11. Describe with necessary theory the method of determining the thermal conductivity of a brass rod.

(or)

12. Describe with necessary theory the method of determining the thermal conductivity of a card board.

13. (a) What is achromatism of lens? Obtain the condition for achromatism when two lenses are in contact. (7)
    (b) What is chromatic aberration? Discuss the lateral chromatic aberration. (5)

(or)

14. (a) Explain spherical aberration with the help of suitable figures and also explain any two methods of minimizing it.
    (b) Explain the defect Coma in optics. How can you remove it?

15. Derive Sabines formula for reverberation time of a hall of volume V.

(or)

16. (a) Explain the factors which affect the acoustics of a building. Give their remedies. (8)
    (b) Explain any one method for the measurement of sound absorption coefficient. (4)

17. (a) Derive an expression for the depression produced in a cantilever. (9)
    (b) A rectangular bar of breadth 2.5 cm, depth 3.3 mm and length 1.5m is fixed at one and a load of 2 kg is applied at the free end. Calculate the depression if the Young's modulus is 12×10^{10} N/m^2. (3)

(or)

18. (a) Describe the statical method of determining the Young's modulus of the given cantilever when the beam is loaded at the centre. (8)
    (b) A wooden bar 3cm breadth and 2 mm thickness is supported on two knife edges 1 m apart. A load of 250 gm at the centre of the bar depresses that point by 2mm. What is the Young's modulus of the bar? (4)

19. Describe G.P. Thomson's experimental method of verifying the wave nature of electrons.

(or)

20. Derive Schrodinger's time independent wave equation in three dimension and hence extend into the time dependent wave equation.