

End-Term Examination

Roll no:

Program Name - M.Sc (Open Elective)

Course Name – Properties of Matter
Course Code – PH 883

Maximum Marks – 50
Total Time: 3 Hours

Attempt all the questions

- Q.1: Define Piezoelectric effect and give example of it in daily life..... (2)
- Q.2: Define shock waves and Mach number. Give examples of shock waves and classification of shock waves on the basis of Mach number..... (8)
- Q.3: Explain 3 modes of heat transfer along with examples for each mode..... (6)
- Q.4: Define Thermal conductivity. Derive the expression of heat flow in composite slab..... (7)
- Q.5: State Stoke's law and derive expression of Terminal velocity..... (4)
- Q.6: Derive the expression of depression in cantilever when the mass of cantilever is effective..... (5)
- Q. 7: Derive and explain Young's modulus, bulk modulus and modulus of rigidity..... (6)
- Q. 8: A uniform glass tube 2 m long, and closed at its lower end, is completely filled with water. Its upper end is rigidly clamped and it is stretched downwards. It is found that whereas length of tube increases by 0.12 cm that of water column in it increases by only 0.08 cm. Calculate Poisson Ratio for the glass of tube..... (3)
- Q. 9: Calculate the mass of water flowing in 10 min through a tube 0.1 cm in diameter 40 cm long if there is constant pressure head of 20 cm of water. The coefficient of viscosity of water is 0.0089 cgs unit.....(3)
- Q. 10: Calculate approximately the heat passing through walls and windows of a room ($5 \times 5 \text{ m}^2$). If the walls are of bricks of thickness 30 cm and have windows of glass 3 mm thick and total area of 5 m^2 . The temperature of room is 30°C below that of outside and thermal conductivity of bricks and of glass is 12×10^{-4} and 25×10^{-4} cgs unit respectively.....(3)
- Q. 11: A steel rod of length 50 cm width 2 cm and thickness 1 cm is bent into form of arc of radius of curvature 2.0 m. Calculate the bending moment. Given Young's modulus of material of rod= $2 \times 10^{11} \text{ N/m}^2$ (3)