16172

2 Hours / 50 Marks Seat No.

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any NINE of the following :** **18**

(a) Define deforming force and restoring force.

(b) Distinguish between tensile stress and tensile strain.

(c) State pressure depth relation of fluid with the meaning of each term in it.

(d) Obtain the expression for viscous force by Newton's law of viscosity.

(e) Name the types of intermolecular force in liquid.

(f) Define Kelvin scale of temperature.

(g) State general gas equation with the meaning of each term in it.

(h) What is the value of temperature at which ideally the pressure of the gas become zero ?

(i) Give the relation between velocity, wavelength and frequency of wave.

(j) Calculate the velocity of wave, if time period and wavelength of wave are 2 ms and 68 cm respectively.

(k) State two examples of stationary wave.

(l) Define Resonance.

2. **Attempt any FOUR of the following :** 16

    (a) Calculate the Young's modulus of wire, if the wire of length 3.14 m, radius 2 mm, extends by 5 mm when a force of 10 N is applied to it.

    (b) Obtain the relation between stress and strain for a wire under continuously increasing load with the help of neat labelled diagram.

    (c) Describe stream line flow and turbulent flow with an example.

    (d) Derive the expression for coefficient of viscosity by Stoke's method.

    (e) Derive the expression for surface tension by capillary rise method.

    (f) Calculate the coefficient of thermal conductivity, if the temperature difference between the faces of aluminium plate is 12 °C when 100 Kcal of heat is absorbed by the plate in 30 minutes. (Given : thickness of plate is 3 mm and area of plate is 10 cm^2)

3. **Attempt any FOUR of the following :** 16

    (a) Explain conduction, convention and radiation. Give one example of each.

    (b) Distinguish between isothermal process and adiabatic process.

    (c) (i) State prism formula with meaning of symbol used.

       (ii) Define total internal reflection and critical angle.

    (d) With neat labelled diagram, explain the principle and propagation of light wave through optical fibre.

    (e) Describe transverse wave and longitudinal wave. Give one example of each.

    (f) (i) State the formula to calculate velocity of sound by resonance tube method.

       (ii) Define free vibrations and forced vibrations.

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