17102

14115

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) 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) State the effect of any two factors on elasticity of material.

b) Calculate stress if a load of 10 N is attached to the lower end of wire of radius 1 mm.

c) Define velocity gradient and state its unit.

d) Calculate the pressure of water having density 1000 kg/m^3 at a depth of 20 m inside the water. (g = 9.8 m/s^2).

e) Give two examples of capillary action.

f) Define

(i) kcal

(ii) Absolute zero.

Marks

g) Explain why C_P is greater than C_V?

h) Define specific heat of gas at constant pressure and volume.

i) The velocity of wave is 300 m/s and wavelength is 100 cm. Calculate its frequency.

j) Define transverse wave and longitudinal wave.

k) State two characteristics of stationary waves.

l) Define resonance.

2. Attempt any <u>FOUR</u> of the following: **16**

a) Find the weight attached to the lower end of wire having length 150 cm, radius 0.3 mm and extension produced is 0.6 mm. if Young's modulus of wire is 2×10^{11} N/m^2.

b) Define

(i) Elastic limit

(ii) Yield point

(iii) Poisson's ratio

(iv) Factor of safety.

c) State Newton's law of viscosity. Define coefficient of viscosity and state its SI unit.

d) Distinguish between streamline and turbulent flow. (four points)

e) A capillary tube of diameter 0.2 mm is dipped in a liquid of density 0.9×10^3 kg/m^3 and angle of contact 24°. If the liquid rises by 41 mm in the tube, find the surface tension of liquid.

f) State the three ways in which heat is transferred from one place to another. Give one example of each.

Marks

3. Attempt any <u>FOUR</u> of the following: **16**

a) State any four applications of conduction.

b) Volume of certain quantity of gas at NTP is 24 litres. What will be the pressure exerted by the same quantity of gas when enclosed in a gas cylinder of capacity 20 litres at 27°C.

c) Obtain prism formula.

d) (i) State the necessary conditions required for propagation of light through optical fibre.

(ii) Draw labelled diagram showing structure of optical fibre.

e) A particle performing SHM has period of 3 sec. Calculate its acceleration at 2 cm from mean position.

f) Define

(i) Amplitude

(ii) Wavelength

(iii) Frequency

(iv) Phase of a particle in SHM.