17102

21718

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) Define : (i) Elastic limit (ii) Factor of safety

(b) Define compressibility. State its SI unit.

(c) State pressure depth relation. Give meaning of each term in it.

(d) Rain drop of diameter 0.03 cm is falling with velocity 2.2 m/s. If co-efficient of viscosity of air is 1.75×10^{-4} Ns/m^2, calculate viscous force on the rain drop.

(e) Define : (a) sphere of influence, (b) molecular range

(f) Define temperature gradient & mention its unit.

(g) State Boyle's law & Charles law.

(h) Explain, why C_p is greater than C_v ?

(i) Define simple harmonic motion. Give its one example.

(j) Find wave frequency of wave having velocity 300 m/s and wavelength 0.3 mm.

(k) Define resonance.

(l) State four characteristics of stationary wave.

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

(a) A wire of diameter 2 mm is stretched by a load of 10 kg. If the extension produced is 1 mm, how far would a wire of same length & material but half of diameter, be stretched by 5 kg mass ?

(b) Explain behaviour of wire under continuously increasing load.

(c) State Newton's law of viscosity. Define co-efficient of viscosity & state its SI unit.

(d) Distinguish between streamline flow & turbulent flow.

(e) Explain Laplace's molecular theory of liquid & hence define surface tension.

(f) Find the quantity of heat conducted in 5 minutes across a silver sheet of size 40 cm × 30 cm of thickness 3 mm. If its two faces are at temperature of 40 ºC & 25 ºC, K for silver = 0.1 Kcal/mºCs.

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

(a) Distinguish between conduction, convection & radiation.

(b) State any four differences between isothermal process & adiabatic process.

(c) Derive prism formula.

(d) (i) State principle of optical fibre.

(ii) Find angle of incidence if angle of refraction is 30º for a glass having refractive index 1.5.

(e) Distinguish between transverse & longitudinal waves.

(f) A tunning fork of frequency 480 Hz resonates with air column of length 16 cm, the end correction is 5 mm. Calculate the velocity of sound in air.
