

17102

11920

2 Hours / 50 Marks

Seat No.

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- 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 SI unit and dimension of stress.
 - b) Identify the more elastic material out of rubber and steel. Give reason.
 - c) State the factors on which pressure at a point inside liquid depends.
 - d) Rain drop of diameter 0.03 cm falls freely through air with a velocity 2.2m/s. If coefficient of viscosity of air = 1.75×10^{-4} N-sec/m²; calculate viscous force acting on the raindrop.
 - e) Define Capillary action. Give one example.
 - f) Define temperature gradient. State its SI unit and CGS unit.

P.T.O.

- g) State :
- (i) Boyle's law
 - (ii) Charle's law for gases.
- h) In gases, C_p is greater than C_v . Give reason. (All the symbols have usual meanings).
- i) A tuning fork of frequency 384 Hz produces sound waves of wavelength 86 cm. Find velocity of wave in SI system.
- j) State any two examples of simple harmonic motion.
- k) Define:
- (i) Node
 - (ii) Antinode
- l) Define Resonance. Give one example.

2. Attempt any FOUR of the following:

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- a) A steel wire of 1 mm diameter and length 1m is stretched by applying a force of 10 N. If the elongation produced is 0.064mm, Calculate the Young's modulus of elasticity of the wire.
- b) Explain the behaviour of wire under continuously increasing load.
- c) State Newton's law of viscosity and hence define coefficient of viscosity.
- d) Explain the concept Reynold's Number. Give its significance.
- e)
 - (i) State the effect of temperature on surface tension.
 - (ii) State the factors affecting angle of contact.
- f) A window pane is $0.5 \text{ m} \times 0.5 \text{ m}$. Its thickness is 0.2 cm. The temperature on its one side is 15°C and on the other side is -1°C . If the rate of conduction of heat is 30 KCal/min, determine the coefficient of thermal conductivity.

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

- a) State three modes of transfer of heat with one application of each.
 - b) Distinguish between isothermal and adiabatic process. (any four points)
 - c) Derive prism formula.
 - d) (i) Draw neat labelled diagram of optical fiber.
(ii) State two conditions for propagation of light wave through optical fiber.
 - e) Define longitudinal wave. State it's any three properties.
 - f) A tuning fork of frequency 512 Hz resonates with an air column of length 14.4 cm. Calculate the velocity of sound in air if the inner diameter of the resonance tube is 2 cm.
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