

17102

13141

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

- Define : (i) Stress (ii) Strain.
- Define Poisson's ratio.
- Define : (i) Velocity gradient (ii) Terminal Velocity.
- State Newton's law of Viscosity.
- State : (i) Pascal's Law (ii) Archimedes Principle.
- Define : (i) Adhesive force (ii) Capillarity.
- Define : (i) Calorie (ii) Absolute zero temperature.
- Define : (i) Temperature gradient (ii) Sp. heat of a gas at constant volume.
- State laws of refraction of light.
- State principle of optical fibre.
- Define : (i) Frequency (ii) Wavelength.
- Define stationary wave. State principle of superposition of waves.

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

- (a) Define :
- (i) Young's modulus
 - (ii) Bulk modulus
 - (iii) Rigidity modulus
- State relation between them.
- (b) Define :
- (i) Streamline flow
 - (ii) Turbulent flow
- Give significance of Reynold's number.
- (c) Distinguish between isothermal and adiabatic processes.
- (d) Derive an equation for prism formula.
- (e) Distinguish between progressive and stationary wave.
- (f) A capillary tube of diameter 0.2 mm is dipped into a liquid of density $0.85 \times 10^3 \text{ kg/m}^3$ and angle of contact 24° . If the liquid rises by 40 mm in the tube, find surface tension of the liquid.

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

- (a) State three gas laws. What is NTP ?
- (b) State three modes of transfer of heat with one example of each. State law of thermal conductivity of heat.
- (c) State Stoke's law of viscosity and obtain an equation for coefficient of viscosity of a liquid.
- (d) An aluminium wire 3 mm in diameter and 4 m long is used to support a mass of 50 kg. What is the elongation of the wire if Young's modulus of aluminium is $7 \times 10^{10} \text{ N/m}^2$?
- (e) Distinguish between transverse and longitudinal waves.
- (f) A tuning fork of frequency 512 Hz resonates with an air column of length 14.4 cm.
- The end correction is 6 mm.
- Calculate velocity of sound in air.
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