



17102

21415

2 Hours/50 Marks

Seat No.

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- Instructions :**
- (1) **All** questions are **compulsory**.
 - (2) **Illustrate** your answers with neat sketches **wherever** necessary.
 - (3) Figures to the **right** indicate **full** marks.
 - (4) **Assume** suitable data, if **necessary**.
 - (5) **Use** of Non-programmable Electronic Pocket Calculator is **permissible**.

MARKS

1. Attempt **any nine** of the following :

18

- a) Define elasticity and plasticity.
- b) State Hooke's law.
- c) State pressure depth relation. Give meaning of each term in it.
- d) Explain the significance of Reynold's number.
- e) Define surface tension. State its SI unit.
- f) Convert 45°C temperature into °F.
- g) Define the two specific heats of gas.
- h) A metal rod of length 0.20 m has one of its ends at 20°C while the other is at 50°C. Find the temperature gradient.
- i) State Snell's law of refraction of light.
- j) Define Amplitude and Frequency.
- k) What are stationary waves ?
- l) Derive the relation $V = n\lambda$.

2. Attempt **any four** of the following :

16

- a) Explain behaviour of wire under continuously increasing load.
- b) A wire of diameter 3 mm and length 4 m extends by 2.5 mm when a force of 10 N is applied. Find the Young's modulus of material of wire.

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- c) Define Young's Modulus, Bulk Modulus and Modulus of rigidity and state relation between them.
- d) State Stoke's law of viscosity and state the formula for coefficient of viscosity.
- e) 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 41 mm in the tube. Find the surface tension of liquid.
- f) Distinguish between isothermal process and adiabatic process.

3. Attempt **any four** of the following :

16

- a) Define three gas laws and specific heat of a substance.
 - b) State the factors affecting conduction of heat and state the relation between them.
 - c) Calculate numerical aperture and acceptance angle for an optical fibre. Given R. I. of core = 1.40. R. I. of cladding = 1.35.
 - d) Explain the phenomenon of total internal reflection for glass material with neat labelled diagram.
 - e) Distinguish between transverse wave and longitudinal wave.
 - 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 the velocity of sound in air.
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