

15116

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
 (2) Answer each next main Question on a new page.
 (3) Figures to the right indicate full marks.
 (4) Abbreviations used convey usual meaning.

Marks**1. Answer any TEN :****10 × 2 = 20**

- (a) State requirements of an ideal unit.
- (b) Draw a labelled diagram of a micrometer screw gauge.
- (c) Resistances 2Ω , 4Ω and 1Ω are connected in parallel. Find the effective resistance.
- (d) State law of intermediate temperature.
- (e) Define :
 - (i) Thermoelectric current
 - (ii) Thermo e.m.f.
- (f) Write magnetic effects of an electric current.
- (g) State Newton's law of viscosity.
- (h) Write characteristics of 'turbulent' flow.
- (i) $\frac{C_p}{C_v} = \gamma$. Write meaning of abbreviations and values of γ for monoatomic, diatomic and triatomic gas.
- (j) Write relationship between dispersive power and R.I.
- (k) Compare : reflection and refraction.
- (l) Write requirements of a good acoustics.
- (m) Write applications of photoelectricity.
- (n) Define 'Planck's constant'. Write its unit.

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2. Answer any FOUR : **4 × 4 = 16**

- (a) (i) (1) Write symbol of 'hecto'.
- (2) Convert 50 milligram to microgram.
- (ii) Name types of errors.
- (b) Define a 'Capacitor'. Explain its principle.
- (c) Write Joule's law. Write its mathematical expression. State meaning of abbreviations used.
- (d) Define 'angle of contact'. State its characteristics.
- (e) Define three coefficients of thermal expansion. Write relation between them.
- (f) Using a resonance tube, describe a method to determine velocity of sound.

3. Answer any FOUR : **4 × 4 = 16**

- (a) Define and explain 'absolute potential'.
- (b) Define a 'shunt'. Describe a method to find shunt resistance.
- (c) Describe Oersted's experiment.
- (d) (i) State Gay Lussac's law.
- (ii) Write values of 'universal gas constant' in different systems.
- (e) (i) Explain principle of Bunsen's photometer.
- (ii) Define :
 - (1) Luminous flux
 - (2) Luminous intensity
- (f) Describe a method to prevent sound pollution.

4. Answer any FOUR : **4 × 4 = 16**

- (a) (i) State laws of Kinematics.
- (ii) A graph is represented by
 $2y - 3x + 5 = 0$, find its :
 - (1) Slope
 - (2) Intercept on 'y' axis
- (b) (i) Write mathematical expression, showing dependence of resistance on temperature.
- (ii) State applications of Wheatstone's bridge.

- (c) Define :
- (i) Plasticity
 - (ii) Elastic limit
 - (iii) Strain
 - (iv) Yield point
- (d) Write procedure to determine viscosity by Stoke's method.
- (e) Define 'transverse waves'. State its characteristics.
- (f) Describe Planck's hypothesis.

5. Answer any FOUR :

4 × 4 = 16

- (a) (i) Write Coulomb's law and its mathematical expression.
- (ii) State properties of lines of force.
- (b) Describe conversion of a galvanometer to Ohmmeter, using a cell.
- (c) Explain relationship between isothermal elasticity and adiabatic elasticity.
- (d) Describe 'pin method' to find refractive index.
- (e) (i) Define :
- (1) Loudness of sound
 - (2) Intensity of sound
- (ii) State logarithmic law of intensity of sound.
- (f) Explain any two properties of ultrasonic waves.

6. Answer any FOUR :

4 × 4 = 16

- (a) Describe a parallel plate capacitor.
- (b) State :
- (i) Ampere's Rule
 - (ii) Fleming's left hand rule
- (c) Define surface tension and surface energy. Explain relationship between them.
- (d) Explain principle of heat conduction.

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- (e) (i) Describe formation of ripples in water.
- (ii) Define :
- (1) Lagging
 - (2) Leading
- (f) Distinguish : X rays and γ rays.
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