INTERMEDIATE PART-I (11th CLASS)

PHYSICS   PAPER-I (OLD SCHEME)   TIME ALLOWED: 2.40 Hours

GROUP-I   **SUBJECTIVE**   MAXIMUM MARKS: 68

NOTE: - Write same question number and its part number on answer book,
         as given in the question paper.

SECTION-I

2.   **Attempt any eight parts.**   **8 × 2 = 16**

(i)   Show that the expression $v_f = v_i + at$ is dimensionally correct.

(ii)   Differentiate between Precision and Accuracy.

(iii)   Write dimensions of   (i) Pressure   (ii) Density

(iv)   Define   (i) Unit vector   (ii) Position vector

(v)   State Second Condition of Equilibrium.

(vi)   Can the magnitude of a vector has a negative value?

(vii)   An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.

(viii)   Derive relation between Force and Linear Momentum.

(ix)   Write expressions for V_1' and V_2' after elastic collision of light body with massive body at rest.

(x)   Prove that 1kWh = 3.6 MJ.

(xi)   An object has 1 J of Potential Energy. What does it mean?

(xii)   A cup is dropped from a certain height, which breaks into pieces. What energy changes are involved?

3.   **Attempt any eight parts.**   **8 × 2 = 16**

(i)   Define Angular Displacement and Angular Acceleration.

(ii)   What is meant by Angular Momentum? Explain Law of Conservation of Angular Momentum.

(iii)   A disc and a hoop start moving down from the top of an inclined plane at the same time. Which one will be moving faster in reaching the bottom?

(iv)   What is the difference between Laminar and Turbulent flow of fluid?

(v)   Define Torricelli's theorem. Also write formula for the speed of efflux of liquid.

(vi)   Explain how a swing is produced in a fast moving cricket ball?

(vii)   What are forced oscillations? Give an example.

(viii)   Can we realize an ideal simple pendulum?

(ix)   If a mass spring system is hung vertically and set into oscillations. Why does motion eventually stop?

(x)   What is effect of density on speed of sound in a gas?

(xi)   What features do longitudinal waves have in common with transverse waves?

(xii)   Why does sound travel faster in solids than in gases?

4.   **Attempt any six parts.**   **6 × 2 = 12**

(i)   Define Huygen's Principle.

(ii)   Why the Polaroid Sunglasses are better than ordinary sunglasses?

(iii)   Could you obtain Newton's rings with transmitted light?

(iv)   What do you mean by Collimator of Spectrometer?

(v)   The image seen through the cheap microscope has coloured edges. Why?

(vi)   Give the principle of Fibre Optics.

(vii)   Why does the pressure of a gas in car tyre increases when driven through some distance?

(viii)   Why the average velocity of the molecules in a gas is zero but the average of the square of velocities is not zero?

(ix)   Does the Entropy of the system increase or decrease due to friction?

SECTION-II

NOTE: - **Attempt any three questions**.

5.(a)   Define rectangular components and explain addition of vectors by rectangular components..   5

   (b)   Find the angle of projection of a projectile for which the maximum height and
          horizontal range are equal.   3

6.(a)   Define absolute Potential Energy and derive its relation.   5

   (b)   Calculate the angular momentum of a star of mass $2.0 \times 10^{30} \, kg$ and radius $7.0 \times 10^5 \, km$,
          if it makes one complete rotation about its axis once in 20 days. What is its Kinetic Energy?   3

7.(a)   What is Fluid Friction?   Calculate the terminal velocity of fog droplet of mass $"m"$ density

         $"p"$ radius $"r"$ falling through air of viscosity $"\eta"$ 5

   (b)   Estimate the average speed of nitrogen molecules in air under standard conditions of pressure
          and temperature.   3

8.(a)   Define Simple Harmonic Motion. Show that a mass attached to a spring performs SHM.
         Find a relation for its time period and frequency.   5

   (b)   The wavelength of the signals from a radio transmitter is 1500 m and frequency is 200 kHz.
          What is the wavelength for a transmitter operating at 1000 kHz and with what speed the
          radio waves travel?   3

9.(a)   Describe the construction and working of Michelson's Interferometer.   5

   (b)   An astronomical telescope having Magnifying Power of 5, consists of two convex lenses
          24cm apart.   Find the Focal lengths of the lenses.   3

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