

INTERMEDIATE PART-I (11th CLASS)**PHYSICS PAPER-I (NEW SCHEME)**

TIME ALLOWED: 3.10 Hours

GROUP-I**SUBJECTIVE**

MAXIMUM MARKS: 83

**NOTE: - Write same question number and its part number on answer book,
as given in the question paper.****SECTION-I****Q.No.2 Attempt any eight parts.****8 × 2 = 16**

- (i) Name several repetitive phenomena occurring in nature could be used reasonable time standards.
- (ii) Does a dimensional analysis give any information on constant of proportionality that may appear in any algebraic expression? Explain.
- (iii) Using rules of Significant figures, compute $\frac{5.348 \times 10^{-2} \times 3.64 \times 10^4}{1.336}$ up to appropriate significant figures.
- (iv) Write dimensions of (i) Pressure (ii) Density
- (v) Define terms (i) Unit Vector and (ii) Position Vector
- (vi) Can you add zero to a null vector?
- (vii) How would the two vectors of the same magnitude have to be oriented, if they were to be combined to give a resultant equal to a vector of the same magnitude?
- (viii) An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity while the object is in air.
- (ix) Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Discuss.
- (x) Differentiate between Elastic and Inelastic collisions.
- (xi) Show that range of Projectile is maximum when projectile is thrown at angle of 45° with the horizontal.
- (xii) Two row boats moving parallel in the same direction are pulled towards each other. Explain.

Q.No.3 Attempt any eight parts.**8 × 2 = 16**

- (i) When a rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from?
- (ii) An object has 1J potential energy. Explain what does it mean?
- (iii) How electrical energy can be obtained from sunlight by Indirect Conversion Method?
- (iv) Define Weightlessness and Gravity Free System.
- (v) Show that Orbital Angular Momentum $L_o = mvr$
- (vi) When mud flies off the tyre of a moving bicycle, in what direction does it fly? Explain.
- (vii) What happens to the period of a Simple pendulum if its length is doubled? What happens if the suspended mass is doubled?
- (viii) If a Mass Spring System is hung vertically and set into Oscillations, why does the motion eventually stop?
- (ix) Define Simple Harmonic Motion. Express it mathematically.
- (x) Why does sound travel faster in solids than in gases?
- (xi) As a result of distant explosion, an observer senses a ground tremor and then hears the explosion. Explain the time difference.
- (xii) Define Beat and Beat Frequency.

Q.No.4 Attempt any six parts.**6 × 2 = 12**

- (i) Under what conditions two or more sources of light behave as coherent sources?
- (ii) Can visible light produce interference fringes? Explain.
- (iii) Why the Polaroid Sunglasses are better than Ordinary Sunglasses?
- (iv) What do you understand by Linear Magnification?
- (v) Explain the difference between Angular Magnification and Resolving Power.
- (vi) Define Reversible Process and Irreversible Process.
- (vii) Does Entropy of a system increase or decrease due to friction?
- (viii) Specific heat of a gas at constant pressure is greater than specific heat at constant volume. Why?
- (ix) Is it possible to convert internal energy into mechanical energy? Explain with example.

SECTION-II**NOTE: - Attempt any three questions of the following:-**

- 5.(a) Define scalar product of two vectors. Also write any four characteristics of scalar product. 1 + 4
- (b) A foot ball is thrown upward with an angle of 30° with respect to the horizontal. To throw a 40 m pass what must be the initial speed of the ball? 3

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- 6.(a) Define absolute gravitational P.E. Derive expression for the absolute value of gravitational P.E of a body at a distance ' r ' from the center of the earth. 5
- (b) What should be the orbiting speed to launch a satellite in a circular orbit 900 km above the surface of earth? (Take $M_e = 6 \times 10^{24} \text{ kg}$ & $R_e = 6400 \text{ km}$) 3
- 7.(a) What is Simple Pendulum? Show that it performs Simple Harmonic Motion. Hence derive formula for its time period. 5
- (b) Find the temperature at which the velocity of sound in air is two times its velocity at 10° C . 3
- 8.(a) Explain the Young's Double Slit Experiment to study the interference of light. 5
- (b) A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least 39° . What is minimum angle for total internal reflection if pipe is in water? (refractive index of water = 1.33) 3
- 9.(a) What is Carnot Engine? Derive expression for the efficiency of Carnot Engine. 1 + 4
- (b) Water flows through a hose, whose internal diameter is 1 cm at a speed of 1 ms^{-1} . What should be the diameter of nozzle if the water is to emerge at 21 ms^{-1} ? 3

SECTION-III (PRACTICAL)

10. (A) Write answers of any four parts. 4 × 2 = 8
- (i) What is meant by Zero Error?
 - (ii) What is use of upper jaws and sliding strip of Vernier Caliper?
 - (iii) Define Node and Antinode.
 - (iv) Define Second Pendulum and what is its frequency.
 - (v) State second condition of Equilibrium.
 - (vi) What types of waves are produced in sonometer, define them?
 - (vii) The speed of sound at 0° C is 332 ms^{-1} . What should be the speed of sound at 40° C ?
 - (viii) What is meant by Index Correction?

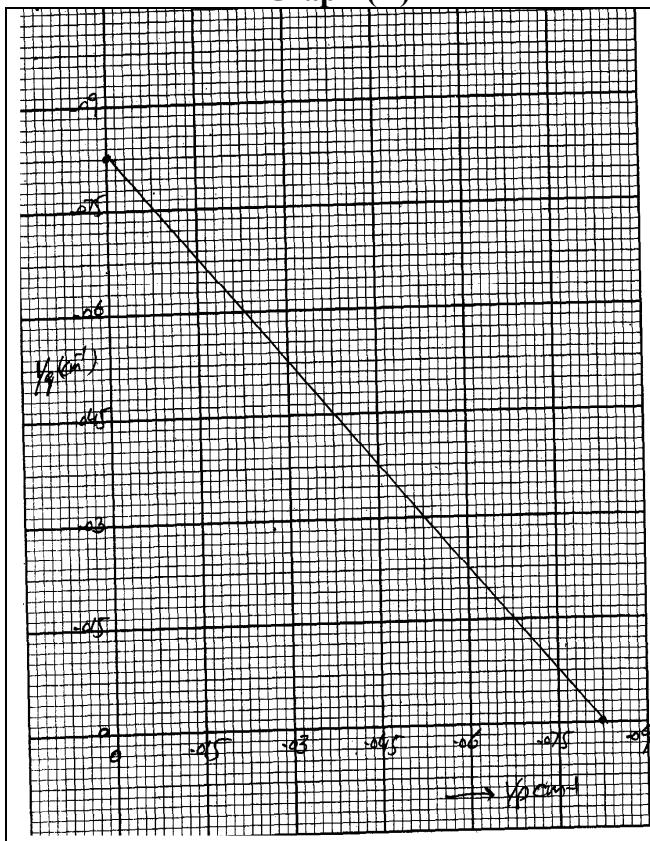
- (B) Write down the procedure of the experiment to find the speed of sound in air at 0° C by using 1st Resonance Method. 3

OR

Write down the procedure of experiment to verify that period of simple pendulum is independent of mass.

- (C) Answer the following questions on the basis of graph drawn below:- 2 × 2 = 4
- (A) (i) Find the X-Intercept of the graph. **OR** (B) (i) Find the spring constant.
(ii) Find the focal length from graph. (ii) What is the slope of graph?

Graph-(A)



Graph-(B)

