Paper Code Number: 2477

2018 (A)

Roll No._____

# INTERMEDIATE PART-I (11th CLASS)

MTN-G1-11-18

## PHYSICS PAPER-I GROUP-I (NEW SCHEME)

TIME ALLOWED: 20 Minutes **OBJECTIVE** MAXIMUM MARKS: 17

**Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.**

**Q.No.1**

(1) If the initial velocity of a projectile becomes doubled. The time of flight will become:-

(A) Double (B) Same (C) 3 times (D) 4 times

(2) For freely falling body, in the presence of force of friction the:-

(A) Loss in P.E. = gain in K.E. (B) Loss in P.E. < gain in K.E.
(C) Loss in P.E. > gain in K.E. (D) Loss in P.E. = 0

(3) The ratio of moment of inertia of hoop to the moment of inertia of disc (if their masses and radii are same) is equal to:- (A) 2 (B) $\frac{1}{2}$ (C) 4 (D) $\frac{1}{4}$

(4) Einstein's theory gives us a physical picture of how the:- (A) Body moves
(B) Gravity works (C) Moment of inertia produced (D) Weightlessness creates

(5) The dimensions of $\rho gh$ has same as that of:-

(A) Work (B) Energy (C) Pressure (D) Mass

(6) Time period of simple pendulum only depends on its:-

(A) Mass (B) Amplitude (C) Density (D) Length

(7) When an observer is moving away from the source with velocity $U_0$ from a stationary source then relative velocity of the waves and the observer is:-

(A) $V + U_0$ (B) $V - U_0$ (C) $\frac{V + U_0}{2}$ (D) Zero

(8) _____ is correct relation.

(A) $\frac{v_t}{v_0} = \frac{\rho_0}{\rho_t}$ (B) $\frac{v_t}{v_0} = \frac{\rho_t}{\rho_0}$ (C) $\frac{v_t}{v_0} = \sqrt{\frac{\rho_t}{\rho_0}}$ (D) $\frac{v_t}{v_0} = \sqrt{\frac{\rho_0}{\rho_t}}$

(9) A ray of light shows the direction of propagation of light. It is a line which is:-

(A) Normal to the wave front (B) Parallel to wave front
(C) Opposite to wave front (D) Equal to wave front

(10) Light waves are:-

(A) Longitudinal waves (B) Transverse waves (C) Stationary waves (D) Mechanical waves

(11) The magnification of a convex lens of focal length 5 cm is equal to:- (A) $\frac{1}{5}$ (B) 5 (C) 6 (D) 25

(12) In adiabatic process the first law of thermodynamics becomes:-

(A) $W = -\Delta U$ (B) $W = Q$ (C) $Q = \Delta U$ (D) $W = -Q$

(13) The change in entropy $\Delta s$ is equal to:-

(A) $\frac{\Delta Q}{\Delta T}$ (B) $\frac{\Delta Q}{T}$ (C) $\frac{\Delta T}{\Delta Q}$ (D) $\frac{T}{\Delta Q}$

(14) In the light of Einstein's famous equation $E = mc^2$, the energy for mass of 2 kg is equal to:-

(A) $3 \times 10^8$ *joule* (B) $9 \times 10^{16}$ *joule* (C) $4 \times 10^{16}$ *joule* (D) $18 \times 10^{16}$ *joule*

(15) The number of significant figures in 0.00232 are:- (A) 6 (B) 5 (C) 3 (D) 4

(16) If both components $R_x$ and $R_y$ of resultant vector $\vec{R}$ are negative then angle "$\theta$" of $\vec{R}$ along $x-$axis will be:-

(A) $\theta = 270^o$ (B) $180^o < \theta < 270^o$ (C) $180^o > \theta > 270^o$ (D) $\theta \leq 270^o$

(17) The magnitude of $\hat{A}$ will be:- (A) Zero (B) $A^2$ (C) 1 (D) $A$

2018 (A) Roll No: _____

# INTERMEDIATE PART-I (11th CLASS)

MTN-G1-11-18

## PHYSICS PAPER-I GROUP-I (NEW SCHEME)

TIME ALLOWED: 2.40 Hours **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) How many nanoseconds are there in 1 year?

(ii) Name several repetitive phenomenon occurring in nature which could serve as reasonable time standards.

(iii) Define Precision and Accuracy.

(iv) Write the dimensions of (i) Work (ii) Torque

(v) Is it possible to add a vector quantity to a scalar quantity? Explain.

(vi) Suppose the sides of a closed polygon represent vector arranged head to tail. What is the sum of these vectors?

(vii) If one of the rectangular components of a vector is not zero, can its magnitude be zero? Explain.

(viii) Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Explain.

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

(x) Explain the circumstances in which the velocity $\vec{v}$ and acceleration $\vec{a}$ of a car are (i) Parallel (ii) Anti-parallel

(xi) Explain the term viscosity.

(xii) A person is standing near a fast moving train. Is there any danger that he will fall towards it?

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

(i) Calculate the work done in kilo joules in lifting a mass of 10 kg (at a steady velocity) through a vertical height of 10 m.

(ii) Define "Joule".

(iii) Write the formula for escape velocity. (Do not derive it). Calculate the value of escape velocity on earth.

(iv) Prove that $S = r\theta$

(v) Explain why an object, orbiting the Earth is said to be freely falling. Use your explanation to point out why objects appear weightless under certain circumstances.

(vi) 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 on reaching the bottom?

(vii) What is Sharpness of Resonance?

(viii) If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop?

(ix) Explain the relation between total energy, potential energy and kinetic energy for a body oscillating with SHM.

(x) Explain effect of density of air on the speed of sound.

(xi) What is the Principle of Super Position of Waves?

(xii) A wave is produced along a stretched string but some of its particles permanently show zero

4. **Attempt any six parts.** $6 \times 2 = 12$

(i) State two parts of Huygen's principle. $1 + 1 = 2$

(ii) How the distance between interference fringes will be affected if the distance between the slits in Young's experiment is doubled?

(iii) How would you distinguish between un-polarized and plane-polarized lights?

(iv) Why adiabate is steeper than isotherm? $1 + 1 = 2$

(v) Draw the ray diagram of compound microscope.

(vi) Differentiate between Multimode Step Index Fibre and Multimode Graded Index Fibre.

(vii) Write any two assumptions of Kinetic Theory of Gases.

(viii) Derive Boyle's Law from Kinetic Theory of Gases.

(ix) Explain bicycle pump as an example of first law of thermodynamics.

## SECTION-II

**NOTE: - Attempt any three questions.** $3 \times 8 = 24$

5.(a) Explain the addition of two vectors by rectangular components method. 5

(b) A football 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

6.(a) Define Gravitational Field. Show that gravitational field is conservative field. 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. 3

7.(a) Prove that the product of cross sectional area of the pipe and the fluid speed at any point along the pipe is a constant. 5

(b) 336 J of energy is required to melt 1 g of ice at $0°C$. What is the change in entropy of 30 g of water at $0°C$ as it is changed to ice at $0°C$ by a refrigerator? 3

8.(a) Discuss the Law of Conservation of Energy in Oscillating Mass Spring System along with the graphical representation. 5

(b) A Church organ consists of pipes, each open at one end, of different lengths. The minimum length is 30 mm and the longest is 4 m. Find the range of frequencies of sound produced, if speed of sound $v = 340\,m/s$. 3

9.(a) What is astronomical telescope? Draw ray diagram and derive an expression for its magnification. 5

(b) In a double slit experiment the $2^{nd}$ order maximum occurs at $\theta = 0.25°$. The wavelength is 650 nm. Find the slit separation. 3