

Paper Code

Number:

2475

2019 (A)

Roll No.

T.C. 000, 2019

INTERMEDIATE PART-I (11<sup>th</sup> CLASS)

## 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) S.I unit of angular momentum is:  
(A)  $\text{Kg m}^2 \text{s}^{-1}$  (B)  $\text{Kg m}^{-2} \text{s}^{-1}$  (C)  $\text{Kg m}^{-1} \text{s}$  (D)  $\text{Kg m}^2 \text{s}^{-2}$
- (2) Fluid dynamics is the study of the behaviour of:  
(A) Fluid at rest (B) Liquids at rest (C) Liquids in motion (D) Liquids and gasses in motion
- (3) Blood has density equal to that of:  
(A) Oil (B) Honey (C) Thick Tar (D) Water
- (4) Acceleration in S.H.M is proportional to the:  
(A) Velocity (B) Displacement (C) Time period (D) Frequency
- (5) If speed of sound in air at a given pressure is "V" and now if pressure is doubled then new speed will be:  
(A)  $2V$  (B)  $V/2$  (C)  $V$  (D)  $4V$
- (6) Stars moving away from Earth show:  
(A) Red shift (B) Blue shift (C) Green shift (D) Yellow shift
- (7) In case of point source, shape of the wavefront is:  
(A) Plane (B) Spherical (C) Circular (D) Elliptical
- (8) Magnifying power of telescope is:  
(A)  $f_o + f_e$  (B)  $f_o - f_e$  (C)  $\frac{f_o}{f_e}$  (D)  $\frac{f_e}{f_o}$
- (9) In case of adiabatic process, the 1<sup>st</sup> law of thermodynamic is written as:  
(A)  $W = \Delta U$  (B)  $W = Q$  (C)  $W = Q - \Delta U$  (D)  $W = -\Delta U$
- (10) If temperature of sink is decreased, the efficiency of Carnot engine.  
(A) Decreases (B) Increases (C) Remain same (D) First increases then decreases
- (11) Which is the base quantity?  
(A) Area (B) Volume (C) Length (D) Density
- (12) If least count is  $10\text{kg}$ , then  $8.00 \times 10^3 \text{kg}$  has significant figures:  
(A) 1 (B) 2 (C) 3 (D) 4
- (13) 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
- (14) Unit vector of a given vector  $\vec{A} = 4\hat{i} + 3\hat{j}$  is:  
(A)  $\frac{4\hat{i} + 3\hat{j}}{25}$  (B) 1 (C)  $\frac{4\hat{i} + 3\hat{j}}{5}$  (D)  $\sqrt{\frac{4\hat{i} + 3\hat{j}}{5}}$
- (15) Time of flight of a projectile is:  
(A)  $\frac{V_i \sin \theta}{g}$  (B)  $\frac{V_i \sin \theta}{2g}$  (C)  $\frac{V_i^2 \sin \theta}{g}$  (D)  $\frac{2V_i \sin \theta}{g}$
- (16) Tidal energy is due to the gravitational pull of:  
(A) Sun (B) Moon (C) Earth (D) Mars
- (17) Moment of inertia for a particle is given by:  
(A)  $m^2 r^2$  (B)  $mr^2$  (C)  $m^2 r$  (D)  $mr^{-2}$

**INTERMEDIATE PART-I (11<sup>th</sup> CLASS)****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****8 × 2 = 16****2. Attempt any eight parts.**

- What is the cause of random error and how can it be reduce?
- If a precise measurement is also an accurate measurement. Explain your answer.
- Is it possible to add 5 in  $2\hat{i}$ ? Explain.
- Can the magnitude of a vector ever be negative? Explain.
- If a vector lies in  $x-y$  plane. Is it possible, one of its rectangular components is zero? Explain.
- Define conservative force. Give at least its two examples. (vii) Explain Geyser and Aquifer.
- Why a fog droplet appear to be suspended in air?
- Derive the relation between speed and pressure of the fluid.
- What is damping and give its one application.
- How does resonance play role in heating and cooking food?
- If mass of a simple pendulum is doubled, what is the effect on its period? Explain.

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

- What are two differences between uniform and variable velocity?
- Can the velocity of an object reverse the direction when acceleration is constant? If so, give an example.
- Explain the two differences between Elastic and in-elastic collision.
- How would you find the distance travelled by velocity-time graph?
- Show that:  $S = r\theta$  (where  $\theta$  is in radian)
- Show that velocity of hoop rolling down on an inclined plane is;  $v = \sqrt{gh}$
- What is meant by moment of inertia? Explain.
- Why does a diver change his body positions before and after diving in the pool?
- Write down two differences between Transverse and Longitudinal waves.
- Explain the terms Crest and Trough
- Why does sound travel faster in solids than in gases?
- How are beats useful in tuning musical instruments? Explain.

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

- How is the distance between interference fringes affected by the separation between the slits of Young's experiment? Can fringes disappear?
- An oil film spreading over a wet footpath shows colours. Explain how does it happen?
- Write two differences between interference and diffraction phenomena of light waves.
- Describe two causes of power losses in optical fibre during transmission of light signals.
- Why would it be advantageous to use blue light with a compound microscope?
- Specific heat of a gas at constant pressure is greater than specific heat at constant volume. Why?
- Does entropy of a system increase or decrease due to friction? Explain.
- Give an example of a natural process that involves an increase in entropy.
- Define triple point of water and write its equation.

**SECTION-II****3 × 8 = 24****NOTE: - Attempt any three questions.**

- What is the difference between Petrol Engine and Diesel engine? Explain the four stroke of Petrol Engine. 5
  - Derive a relation for the time period of a simple pendulum by using Dimensional analysis. 3
- What is Torque? Derive an expression for torque due to force acting on a rigid body. 5
  - A bomber dropped a bomb at a height of 490m when its velocity along the horizontal was  $300 \text{ Km h}^{-1}$ . How long was it in air? 3
- Explain work done in gravitational field. Also define conservative field. 5
  - A stationary wave is established in a string which is 120cm long and fixed at both ends. The string vibrates in four segments, at a frequency of  $120 \text{ Hz}$ . Determine its wavelength and the fundamental frequency. 3
- Define simple harmonic motion. Prove that the projection of a particle moving along a circular path performs simple harmonic motion. 5
  - What is the least speed at which an aeroplane can execute a vertical loop of 1km radius so that there will be no tendency for the pilot to fall down at the highest point? 3
- Discuss the Young's double slit experiment and determine the position where the dark and bright fringes will be observed. 5
  - A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least  $39^\circ$ . What is the minimum angle for total internal reflection if pipe is in water? (Refractive index of water = 1.33) 3

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INTERMEDIATE PART-I (11<sup>th</sup> CLASS)

## PHYSICS PAPER-I GROUP-II (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) 2.0 radian is equal to:  
(A)  $57.3^\circ$  (B)  $57.6^\circ$  (C)  $114.6^\circ$  (D)  $115.6^\circ$
- (2) Artificial gravity like earth is obtained, if space ship rotate with frequency:  
(A)  $\frac{1}{2\pi}\sqrt{gR}$  (B)  $\frac{1}{2\pi}\sqrt{2gR}$  (C)  $\frac{1}{4\pi}\sqrt{gR}$  (D)  $\frac{1}{2\pi}\sqrt{\frac{g}{R}}$
- (3) The relation  $v_2 = \sqrt{2g(h_1 - h_2)}$  is called:  
(A) Torricelli's theorem (B) Venturi relation (C) Stoke's law (D) Equation of continuity
- (4) Viscosity of air at  $30^\circ\text{C}$  is:  
(A)  $6.29\text{ Nsm}^{-2}$  (B)  $0.019\text{ Nsm}^{-2}$  (C)  $1.00\text{ Nsm}^{-2}$  (D)  $0.510\text{ Nsm}^{-2}$
- (5) The velocity of spring-mass vibrating system at mean position is:  
(A) Zero (B)  $\sqrt{\frac{k}{m}}$  (C)  $x_0\sqrt{\frac{k}{m}}$  (D)  $w\sqrt{\frac{k}{m}}$
- (6) If a stationary wave is established along a stretched string of length  $\ell$  and it vibrates in one loop, the wave length is equal to:  
(A)  $\ell$  (B)  $\frac{\ell}{2}$  (C)  $\frac{\ell}{3}$  (D)  $2\ell$
- (7) The value of " $\gamma$ " for polyatomic gas is:  
(A) 1.40 (B) 1.29 (C) 1.67 (D) 1.19
- (8) The property of the substances by which their concentration in solutions can be found is:  
(A) Optical rotation (B) Interference (C) Diffraction (D) Reflection
- (9) The ratio  $\frac{c}{v}$  is equal to:  
(A) Critical angle (B) Total reflection (C) Refractive index (D) Angle of refraction
- (10) Human metabolism is the example of:  
(A) First law of thermodynamics  
(B) Entropy (C) Second law of thermodynamics (D) Adiabatic process
- (11) In which process entropy of the system remains constant?  
(A) Isothermal (B) Isochoric (C) Irreversible (D) Adiabatic
- (12) There are four readings of a micrometer to measure the diameter of a wire in mm are 1.21, 1.23, 1.25, 1.23. The mean of deviations is:  
(A) 0.02 mm (B) 0.01 mm (C) 0.10 mm (D) 0.20 mm
- (13) The correct answer of  $\frac{5.348 \times 10^{-2} \times 3.64 \times 10^4}{1.336}$  is:  
(A)  $1.46 \times 10^3$  (B)  $1.451 \times 10^3$  (C)  $1.457 \times 10^3$  (D)  $1.5 \times 10^3$
- (14)  $\vec{B} \cdot \vec{B}$  is equal to:  
(A)  $B^2$  (B) 1 (C) Zero (D)  $B$
- (15) Two forces of magnitude 10N each. Their resultant is equal to 20N. Then angle between them is:  
(A)  $180^\circ$  (B)  $30^\circ$  (C)  $90^\circ$  (D)  $0^\circ$
- (16) The velocity of a body changes with constant rate. Then acceleration is:  
(A) Zero (B) Constant (C) Negative (D) Positive
- (17) The dimensions of the ratio of power to work are:  
(A)  $[ML^2T^{-2}]$  (B)  $[M^0LT^{-1}]$  (C)  $[M^0L^0T^{-2}]$  (D)  $[ML^0T^{-1}]$

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**INTERMEDIATE PART-I (11<sup>th</sup> CLASS)****PHYSICS PAPER-I GROUP-II (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) What is Radian? Explain with diagram.
- (ii) Calculate the 1 light year in metres.
- (iii) How does the direction of a vector specified in three dimensions? Explain with diagram.
- (iv) Show that:  $\hat{i} \cdot \hat{j} = \hat{j} \cdot \hat{k} = \hat{k} \cdot \hat{i} = 0$
- (v) Is it possible to add a vector quantity to a scalar quantity? Explain.
- (vi) Write two differences between conservative and non-conservative forces.
- (vii) Calculate the work done in kilo joules in lifting a mass of 10kg (at steady velocity) through a vertical height of 10m.
- (viii) What is Stoke's Law? Explain briefly.
- (ix) State Torricelli's theorem? Write mathematical form.
- (x) What is Hook's law? Define spring constant.
- (xi) On what factors does the velocity of mass-spring system depends?
- (xii) If a mass-spring is hung vertically and set into oscillations, why does the motion eventually stop?

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

- (i) Discuss the case in velocity time graph, when the car moves with constant acceleration.
- (ii) What is the difference between uniform velocity and uniform acceleration?
- (iii) Write down the impact on the bodies when a lighter body collides with a massive body at Rest. Explain by the Mathematical relation.
- (iv) Discuss the case in velocity time graph, when the acceleration is increasing.
- (v) What is meant by moment of inertia? Explain its significance.
- (vi) Convert two Radian in degree.
- (vii) 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? Explain.
- (viii) Define Angular Momentum and Law of Conservation of Angular Momentum.
- (ix) Describe the relation between pressure and density.
- (x) What is the difference between open and closed organ pipe?
- (xi) What are the conditions for a path difference in constructive and destructive interference?
- (xii) Why did Newton fail to calculate the velocity of sound accurately?

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

- (i) How would you manage to get more orders of spectra using a diffraction grating?
- (ii) Write the equations of conditions for constructive and destructive interference.
- (iii) Why the Polaroid sunglasses are better than ordinary sunglasses?
- (iv) One can buy a cheap microscope for use of children. The images seen in such a microscope have coloured edges. Why is this so?
- (v) A magnifying glass gives a five times enlarged image at a distance of 25cm from the lens. Find, by ray diagram, the focal length of the lens.