

Paper Code

Number:

2472

2019 (A)

Roll No.

INTERMEDIATE PART-I (11th CLASS)

MTN-11-G2-19

PHYSICS PAPER-I GROUP-II (NEW SCHEME)
TIME ALLOWED: 20 Minutes

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) 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
- (2) The correct answer of $\frac{5.348 \times 10^{-2} \times 3.64 \times 10^4}{1.336}$ is:
(A) 1.46×10^3 (B) 1.451×10^3 (C) 1.457×10^3 (D) 1.5×10^3
- (3) $\vec{B} \cdot \vec{B}$ is equal to:
(A) B^2 (B) 1 (C) Zero (D) B
- (4) Two forces of magnitude 10N each. Their resultant is equal to 20N. Then angle between them is:
(A) 180° (B) 30° (C) 90° (D) 0°
- (5) The velocity of a body changes with constant rate. Then acceleration is:
(A) Zero (B) Constant (C) Negative (D) Positive
- (6) The dimensions of the ratio of power to work are:
(A) $[ML^2T^{-2}]$ (B) $[M^0LT^{-1}]$ (C) $[M^0L^0T^{-2}]$ (D) $[ML^0T^{-1}]$
- (7) 2.0 radian is equal to:
(A) 57.3° (B) 57.6° (C) 114.6° (D) 115.6°
- (8) 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) $\frac{1}{2\pi} \sqrt{\frac{g}{R}}$
- (9) 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
- (10) Viscosity of air at $30^\circ C$ is:
(A) $6.29 Nsm^{-2}$ (B) $0.019 Nsm^{-2}$ (C) $1.00 Nsm^{-2}$ (D) $0.510 Nsm^{-2}$
- (11) 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) $w \sqrt{\frac{k}{m}}$
- (12) If a stationary wave is established along a stretched string of length ℓ and it vibrates in one loop, the wave length is equal to:
(A) ℓ (B) $\frac{\ell}{2}$ (C) $\frac{\ell}{3}$ (D) 2ℓ
- (13) The value of " γ " for polyatomic gas is:
(A) 1.40 (B) 1.29 (C) 1.67 (D) 1.19
- (14) The property of the substances by which their concentration in solutions can be found is:
(A) Optical rotation (B) Interference (C) Diffraction (D) Reflection
- (15) The ratio $\frac{c}{v}$ is equal to:
(A) Critical angle (B) Total reflection (C) Refractive index (D) Angle of refraction
- (16) Human metabolism is the example of:
(A) First law of thermodynamics (B) Entropy (C) Second law of thermodynamics (D) Adiabatic process
- (17) In which process entropy of the system remains constant?
(A) Isothermal (B) Isochoric (C) Irreversible (D) Adiabatic

INTERMEDIATE PART-I (11th CLASS)

MTN-11-519

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 $8 \times 2 = 16$

2. Attempt any eight parts.

- (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?

 $8 \times 2 = 16$

3. Attempt any eight parts.

- (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?

 $6 \times 2 = 12$

4. Attempt any six parts.

- (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.

P.T.O

- (vi) Explain that the average velocity of the molecules in a gas is zero but the average of the square of velocities is not zero.
- (vii) Give an example of a process in which no heat is transferred to or from the system but the temperature of the system changes.
- (viii) Can the mechanical energy be converted into heat energy? If so give an example.
- (ix) Write the names of four processes involved in a cyclic process of petrol engine.

SECTION-II

NOTE: - Attempt any three questions.

3 × 8 = 24

- 5.(a) Describe the relation for pressure of a gas enclosed in a vessel by applying kinetic theory of gases. 5
- (b) How many metres are in on light year? If speed of light is $3 \times 10^8 \text{ ms}^{-1}$. 3
- 6.(a) Discuss elastic collision in one dimension and prove that speed of approach is equal to the speed of separation. 5
- (b) The magnitude of dot and cross products of two vectors are $6\sqrt{3}$ and 6 respectively. Find the angle between the vectors. 3
- 7.(a) Prove that for a body of mass 'm' at a height 'h' above the surface of Earth when released and falls its:
Loss in P.E = Gain in K.E. 5
- (b) The wavelength of the signals from a radio transmitter is 1500m and the frequency is 200 kHz. What is the wavelength for a transmitter operating at 1000 kHz and with what speed the radio waves travel? 3
- 8.(a) What do you mean by geostationary orbits? Find the expression for the orbital radius of geostationary satellite. 5
- (b) A block of mass 4kg is dropped from a height of 0.8m on to a spring of spring constant $K = 1980 \text{ Nm}^{-1}$. Find the maximum distance through which spring will be compressed. 3
- 9.(a) Describe the Michelson's experiment to calculate the speed of light? 5
- (b) A light is incident normally on a grating which has 2500 lines per centimetre. Compute the wavelength of a spectral line for which the deviation in second order is 15.0° . 3