Physics

Paper I (Objective Type)

Time : 20 Minutes

Marks : 17

D L.K.No. 809

(Inter-A-2018)

Inter (Part - I)

Paper Code No. 6477

New Pattern

Group Ist

Session (2015- 2017) to (2017 - 2019)

BwP   FEW-G1-11-18

Note : Four possible choices A , B , C , D to each question are given. Which choice is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result In zero mark in that question.

Q.No.1

(1) Number of Steradians in a Solid Sphere is : (A) π (B) 2π (C) 4π (D) $\dfrac{\pi}{2}$

(2) If a Vector $\vec{A}$ makes an angle 0° with x - axis then its x - component is : (A) $A\cos\Theta$ (B) A^2 (C) A (D) $A\sin\Theta$

(3) The Magnitude of $\hat{i} \times \hat{j}$ is equal to : (A) 1 (B) $\hat{K}$ (C) $-\hat{K}$ (D) Zero

(4) Significant Figures in $0\cdot 0010$ are : (A) 1 (B) 2 (C) 3 (D) 4

(5) Original Source of Energy for Biomass is : (A) Earth (B) Moon (C) Sun (D) Star

(6) Change of Momentum is called : (A) Acceleration (B) Impulse (C) Force (D) Pressure

(7) Angular Momentum has the same unit as :

(A) Impulse x Distance (B) Power x time (C) Linear Momentum x time (D) Work x frequency

(8) The number of Satellite which form the Global Positioning System close to earth are :

(A) 22 (B) 24 (C) 30 (D) 34

(9) A $6\cdot 0$ meter high tank is full of water. A hole appears at its middle. What is speed of efflux :

(A) $5\cdot 66\ ms^{-1}$ (B) $6\cdot 66\ ms^{-1}$ (C) $7\cdot 66\ ms^{-1}$ (D) $8\cdot 66\ ms^{-1}$

(10) In a Stretched String , if speed of Wave is doubled the tension will be :

(A) 2 (B) 4 (C) 8 (D) 6

(11) In which of following Speed of Sound Wave is greatest :

(A) Air (B) Water (C) Vaccum (D) Steel

(12) The Dimensions of Spring Constant " K " are :

(A) $[\,MT^{-2}\,]$ (B) $[\,M^{-2}T\,]$ (C) $[\,M^2T^{-2}\,]$ (D) $[\,MLT^{-2}\,]$

(13) The locus of all points in the same Phase of Vibration is called :

(A) Wave Front (B) Interference (C) Diffraction (D) Polarization

(14) The Internal Energy of System does not depend on :

(A) Temperature (B) Pressure (C) Path (D) Initial and Final State

(15) The least distance of Distinct Vision is : (A) 5 cm (B) 10 cm (C) 30 cm (D) 25 cm

(16) Which is not Optically Active : (A) Sugar (B) Tartaric Acid (C) Water (D) Sodium Chlorate

(17) The Mean Kinetic Energy of Gas is zero at :

(A) $0^{\circ}C$ (B) $-273^{\circ}C$ (C) $100\ K$ (D) $100^{\circ}C$

Note : It is compulsory to attempt (8 - 8) parts each from Q.No.2 and Q.No.3 while attempt any (6) parts from Q. No.4 and attempt any (03) questions from Part II. Write same Question No. and its Part No. as given in the question paper.

BwP   Part - I   -G₁-11-18   22 x 2 = 44

Q.No.2 (i) Write the dimensions of :   (i) Pressure   (ii) Density

(ii) How many Nanoseconds in one year ?

(iii) Define Precision and Accuracy.

(iv) The time period of Simple Pendulum is measured by the stop watch. What type of errors are possible in the time period?

(v) Is it possible to add a Vector Quantity to Scalar Quantity ? Explain.

(vi) Write down the condition for a body to be a complete equilibrium.

(vii) Prove that $\vec{A} \cdot \vec{B} = A_x B_x + A_y B_y + A_z B_z$

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

(ix) Write any two properties of an Inertial frame of Reference.

(x) Define Impulse. Also give its S.I. Unit.

(xi) Explain what do you understand by the term Viscosity.

(xii) Define Torricelli's Theorem.

Q.No.3 (i) Calculate the work done in Kilo Joules in lifting a mass of 10 Kg through a vertical height of 10 m.

(ii) Define Joule and Watt.

(iii) Derive the relation between Power, Force and Velocity.

(iv) 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?

(v) Why does a diver change his body position before and after diving in the pool ?

(vi) Why Einstein's Theory of Gravitation is better than Newton's ?

(vii) Why the Motion of Projection of a point revolving in a circle with variable angular velocity is not Simple Harmonic Motion ?

(viii) What do you mean by Phase?

(ix) What is meant by Phase Angle ? Does it define angle between Maximum Displacement and the Deriving Force?

(x) Is it possible for two Identical Waves travelling in the same direction along a string to give rise to a stationary wave?

(xi) How should a sound source move with respect to an observer, so that the frequency of its sound does not change?

(xii) Taking an example of Periodic Wave, prove that $v = f\lambda$

Q.No.4 (i) Why the Polaroid Sunglasses are better than Ordinary Sunglasses?

(ii) An oil film spreading over a wet footpath shows colours. Explain briefly.

(iii) Write two points of Huygen's Principle.

(iv) Focal Length of a Convex Lens is 5 cm. Calculate its magnification.

(v) Define Refractive Index of a Medium. Write its two mathematical forms.

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

(vii) Why the Average Velocity of the Molecules in a Gas is zero, but the average of square of the velocity is not zero? Explain.

(viii) Define Adiabatic Process. Give one example.

(ix) No Spark Plug is used in Diesel Engine. How it gets ignition?

P.T.O.

Q.No.5 (a) Define Projectile and derive an expression for maximum height and Horizontal Range of the projectile?   (5)

(b) The magnitude of Dot and Cross Products of two vectors are $6\sqrt{3}$ and 6. Find the angle between the vectors.   (3)

Q.No.6 (a) Define Absolute P.E. Derive an expression for it in Gravitational Field.   (5)

(b) A Gramophone Record turn table accelerates from rest to an angular velocity of 45 rev min^{-1} in 1·60 second. What is its Average Angular Acceleration?   (3)

Q.No.7 (a) State First Law of Thermodynamics and apply this law in Isothermal Expansion and in Adiabatic Expansion Processes.   (5)

(b) A Heat Engine performs 100 J of Work and at the same time rejects 400 J of Heat Energy to the cold reservoirs. What is the efficiency of the Engine?   (3)

Q.No.8 (a) What is Simple Pendulum? Show that its time period depends only on the length and acceleration due to Gravity.   (5)

(b) Find the temperature at which the velocity of Sound in air is two times its velocity at $10^{o}C$?   (3)

Q.No.9 (a) What is Simple Microscope? Derive the relation for its Magnification?   (5)

(b) In Double Slit Experiment, the second order maximum occurs at $\Theta = 0·25^{o}$. The Wavelength is 650 nm. Calculate the Slit Separation.   (3)