BWP-G1-11-19

Physics	(A)	L.K.No. 1109	Paper Code No. 6471
Paper I	(Objective Type)	Inter -A- 2019	(New Pattern)
Time :	20 Minutes	Inter (Part I)	(Group Ist)
Marks :	17	Session (2015 -17) to (2018 - 20)	

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 No. 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) The numerical value of constants in any formula cannot be determined by dimensional analysis , however it can be found by :

(A) Addition (B) Physical Quantities (C) Experiments (D) Uncertainity

(2) A measurement taken by Vernier Calliper with least count as 0 . 01 cm is recorded as 0 . 45 cm , it has fractional uncertainity : (A) 0 . 01 (B) 0 . 02 (C) 0 . 03 (D) 0 . 45

(3) The Unit Vector in the direction of $\vec{A}$ is :

(A) $\hat{A} = \frac{A}{\vec{A}}$ (B) $\hat{A} = A\vec{A}$ (C) $\hat{A} = \frac{\vec{A}}{A}$ (D) $\vec{A} = \frac{A}{\hat{A}}$

(4) If $\vec{A} \times \vec{B}$ is along y – axis, then $\vec{A}$ and $\vec{B}$ are in :

(A) x – y Plane (B) y – z Plane (C) Space (D) x – z Plane

(5) Everything in the vastness of space is in a state of :

(A) Rest (B) Rectilinear Motion (C) Perpetual Motion (D) Projectile Motion

(6) One Watt Hour is equal to : (A) 3 . 6 MJ (B) 3 . 6 KJ (C) 36 KJ (D) 36 MJ

(7) Angle 30° is equal to : (A) $\frac{\pi}{2}$ rad (B) $\frac{\pi}{3}$ rad (C) $\frac{\pi}{4}$ rad (D) $\frac{\pi}{6}$ rad

(8) The Rotational K.E. of Disc is equal to : (A) $\frac{1}{4}mv^2$ (B) $\frac{1}{2}mv^2$ (C) $\frac{1}{4}Iw^2$ (D) Iw^2

(9) A 20 metre high tank is full of water. A hole appears at its middle. The speed of efflux will be :

(A) $10\ ms^{-1}$ (B) $14\ ms^{-1}$ (C) $11.5\ ms^{-1}$ (D) $9.8\ ms^{-1}$

(10) Bernoulli's Equation based upon Law of Conservation of :

(A) Mass (B) Linear Momentum (C) Angular Momentum (D) Energy

(11) If the Initial Phase is $\frac{\pi}{2}$ then displacement of SHO is :

(A) $x = x^2_o \sin wt$ (B) $x = \sin wt$ (C) $x = x_o \cos wt$ (D) Zero

(12) When an Observer is moving away from a stationary source , sending waves with speed v , the waves received by him at the rate of : (A) $\frac{v - u_o}{\lambda}$ (B) $\frac{v + u_o}{\lambda}$ (C) $\frac{\lambda}{v - u_o}$ (D) $\frac{\lambda}{v + u_o}$

(13) When a Transverse Wave travelling in rare medium , incident on denser medium after reflection phase changes by : (A) 360° (B) 180° (C) 90° (D) 0°

(14) Polarization proves that light waves are : (A) Longitudinal (B) Stationary (C) Matter (D) Transverse

(15) The magnifying power of a magnifying glass is : (A) $1 - \frac{d}{f}$ (B) $1 - \frac{f}{d}$ (C) $\frac{f}{d}$ (D) $\frac{d}{f} + 1$

(16) If C_p for a gas is $\frac{7R}{2}$ then the value of C_v will be : (A) $\frac{3R}{2}$ (B) $\frac{5R}{2}$ (C) $\frac{9R}{2}$ (D) R

(17) If the temperature of sink is equal to absolute zero , the efficiency of heat engine should be :

(A) 100 % (B) 50 % (C) Zero (D) Infinity

B

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Roll No.	1109 - 25200	Session (2015 –17) to (2018 – 20)	Inter (Part – I) / (Group Ist)
Physics (Subjective)	Inter – A -2019	Time 2 : 40 Hours Marks : 68	(New Pattern)

Note : It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2, Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part – II .Write the Same Question Number and its Part Number given in the Question Paper

Make Diagram where necessary.

Part - I

22 x 2 = 44

Q.No.2
(i) Show that Einstein Equation $E = mc^2$ is dimensionally correct.
(ii) Given that $V = (5.2 \pm 0.1)$ volt . Find its percentage uncertainity.
(iii) What is a Unit Vector ? Give its formula.
(iv) Can a body rotate about its centre of gravity under the action of its weight? Explain.
(v) Can the magnitude of a vector have a negative value? Discuss.
(vi) Define Joule using formula for the work done.
(vii) When a rocket re – enters the atmosphere, its nose cone becomes hot. Where does this heat energy come from?
(viii) Define Drag Force. Give its formula.
(ix) Two row boats moving parallel in the same direction are pulled towards each other. Explain.
(x) Does the Acceleration of a Simple Harmonic Oscillator remain constant during its motion ? Is the Acceleration ever zero? Explain.
(xi) If a mass spring system is hung vertically and set into oscillations , why does the motion eventually stop?
(xii) Name two characteristics of Simple Harmonic Motion.

Q.No.3
(i) Explain the condition in which velocity " v " is zero and acceleration of a car is not zero.
(ii) Define Isolated System. Give its example.
(iii) Define Impulse. Give its units.
(iv) At what point or points in its path does a projectile have its minimum speed , its maximum speed ?
(v) Explain what is meant by Centripetal Force ? Give its formula.
(vi) Show that Orbital Angular Momentum is given as $L_O = mvr$
(vii) Give one practical application of the Rotational Kinetic Energy.
(viii) Why does a Diver change his body position before and after diving in the pool?
(ix) What is the effect of pressure of the Medium on the speed of sound?
(x) Differentiate between Transverse and Longitudinal Waves.
(xi) Explain why sound travels faster in Warm Air than Cold Air?
(xii) Explain the term Nodes and Antinodes.

Q.No.4
(i) For what purpose Huygen's Principle is used?
(ii) How would you manage to get more orders of Spectra using a diffraction grating?
(iii) An oil film spreading over a wet footpath shows colours. Explain how does it happen ?
(iv) If a person was looking through a telescope at the full moon , how would the appearance of the moon be changed by covering half of the objective lens?
(v) Define Resolving Power. Give its expression.
(vi) What happens to the temperature of the room, when an air conditioner is left running on a table in the middle of the room?
(vii) Is it possible to construct a heat engine that will not expel heat into the atmosphere ?
(viii) Carnot Cycle provides the basis to define a temperature scale that is independent of material properties. Explain.
(ix) Define Entropy. Explain in terms of Second Law of Thermodynamics.

Part - II

Q.No.5 (a) Define Molar Specific Heats of Gases and prove that the relation $C_p - C_v = R$ (5)
(b) The length and width of rectangular plate are measured to be 15 . 3 cm and 12 . 80 cm respectively. Find the correct area of the plate. (3)

Q.No.6 (a) State and explain law of Conservation of Linear Momentum. (5)
(b) A load of 10 N is suspended from a clothes line. This distorts the line so that it makes an angle of 15^o with the horizontal at each end. Find the tension in the clothes line. (3)

Q.No.7 (a) Prove that the work done is independent of the path followed in Gravitational Field. (5)
(b) An Organ Pipe has a length of 50 cm. Find the frequency of its fundamental note and the next harmonic when it is open at both ends. (3)

Q.No.8 (a) Discuss the energy conservation in SHM. (5)
(b) Calculate the angular momentum of a Star of Mass 2×10^{30} Kg and radius 7.0×10^5 Km. If it makes one complete rotation about its axis once in 20 days. (3)

Q.No.9 (a) What is Interference of Light? Discuss the Young's Double Slit Experiment. Also Derive the relation for Fringe Spacing. (5)
(b) An Astronomical Telescope having magnifying power of 5 consists of two thin lenses 24 cm apart. Find the Focal Length of the lenses. (3)