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4/8/23

95

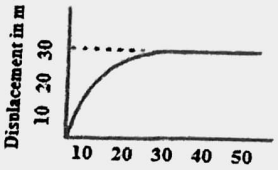
1ST PERIODIC TEST: 2023-2024, CLASS: XI (PHYSICS)

TIME: 90 MINUTE **MAX MARKS: 40**

GENERAL INSTRUCTION:

1: All questions are compulsory.2: There is no overall choice
3: Question 1to 10 are very short answer type question carrying 1 mark each
4: Question no 11 to 15 is short answer type questions carrying 2 marks each.
5: Question no 16 to 18 is also short answer type questions carrying 3 marks each.
6: Question no 19 to 21 assertions and reason type question carrying 1 marks each.
7: Question number 22and 23 are case study question of 4 marks each.

Q.1 What does the displacement of the particle shown in the graph indicate?



(a) It indicates a constant velocity
(b) It indicates a constant acceleration
(c) It indicates that the particle starts with a constant velocity and is accelerated
(d) It indicates that the motion is retarded and the particle stops

Q.2 The position coordinate of a moving particle is given by $X = 9t^2+4t+2$ m. What is its velocity at t= 2sec?

(a) 20 m/sec (b) 10 m/sec (c) 40 m/sec (d) 30 m/sec

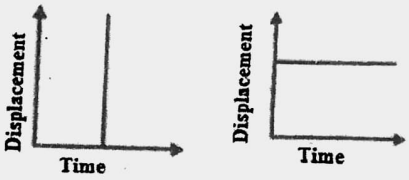
Q.3 Area under speed time graph represents-

(a) Distance (b) Acceleration (c) Momentum (d) Speed

Q.4 The number of significant figures in 0.06900 is-

(a) 5 (b) 4 (c) 2 (d) 3

Q.5 Which of the following is not possible for a body in uniform motion?

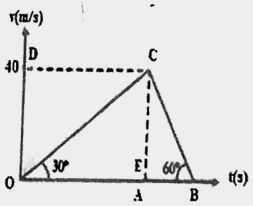


(a). A (b) B (c) Both (A) & (B) (d) None of the above

Q6: A screw gauge gives the following readings when used to measure the diameter of a wire Main scale reading : 0 mm Circular scale reading : 52 divisions Given that 1 mm on main scale corresponds to 100 divisions on the circular scale. The diameter of the wire from the above data is :

(a) 0.026 cm (b) 0.26 cm (c) 0.052 cm (d) 0.52 cm

Q7 What is the ratio of the average acceleration during the intervals OA and AB in the velocity-time graph as shown below?



(a) ½ (b) ⅓ (c) 1 (d) 3

Q8: What will the value of $\hat{\imath} \times \hat{\jmath}$

(a) $\hat{\imath}$ (b) $\hat{\jmath}$ (c) $\hat{k}$ (d) $\hat{0}$

Q.9 The greatest height to which a man can a stone is h, the longest distance upto which he can throw the stone is

(a) h (b) 2h (c) 3h (d) 4h

Q.10 A new system of unit is proposed in which mass is α kg, length β m and unit of time γ sec. How much will 10 Joule measure in this new system?

Q.11 Find the dimensions of a/b in the equation $F=a\sqrt{x}+bt^2$, where F is force and x is distance and t is time.

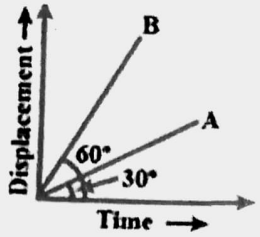
OR

Find the dimensions of linear momentum and surface tension in terms of velocity density and frequency as a fundamental quantities.

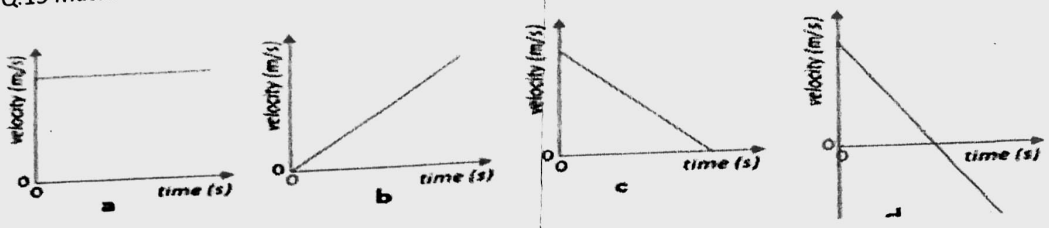
Q12 . Find the value of 'λ' so that the vector $\vec{A} = 2\hat{\imath} + \lambda\hat{\jmath} + \hat{k}$ and $\vec{B} = 4\hat{\imath} - 2\hat{\jmath} - 2\hat{k}$ are perpendicular to each other.

Q13. A car travelling at speed 150km/h is stopped after covering a distance of 27m. If the initial velocity is one third then after how much distance the car would stop?

Q.14 Two straight lines drawn on the same displacement time graph make single 30 degree and 60° with time access respectively as shown in the figure which line represents greater velocity. what is the ratio of the two velocities.



Q.15 Match the following graphs with the correct statement.



(a).Constant Acceleration (b) Constant deceleration (c) Constant Velocity
(d) Constant deceleration to rest then constant acceleration in the opposite direction

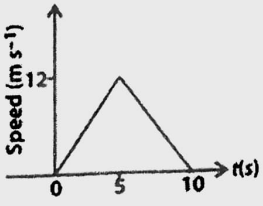
Q.16 The frequency n of vibration of a stretched string depends upon its length **l**, its mass per unit length **m** and Tension **T** in the string. Obtain dimensionally an expression for frequency **n**.

Q17. . Derive $s = ut + 1/2\ at^2$ by graphical method.

Q18.The speed-time graph of a particle moving along a fixed direction is shown in figure. Obtain the distance traversed by the particle between

(a) t = 0 s to 10 s, (b) t = 2 s to 6 s.

What is the average speed of the particle over the intervals in (a) and (b)?



ASSERTION AND REASON TYPE QUESTIONS

Directions: The question numbers 19 to 21 consist of two statements one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

(a) If both A and R are true and R is the correct explanation of A
(b) If both A and R are true but R is NOT the correct explanation of A
(c) If A is true but R is false (d) If A is false and R is true

19). A : Displacement of a body may be zero, when distance travelled by it is not zero.
R : The displacement is the larger distance between initial and final positions.

20) A : A body may be accelerated even when it is moving uniformly.
R : When direction of motion of the body is changing ,the body must have acceleration.

21) A: A physical quantity cannot be called as a vector if its magnitude is zero.
R : A vector has both magnitude and direction.

Q22: The acceleration of an object is said to be uniform acceleration if its velocity changes by equal amount in equal interval of time, however small these time intervals may be. A particle is moving with uniform acceleration in x-direction, the displacement x of particle varies with time t as

$x = 4t^2 - 15t + 25$ m

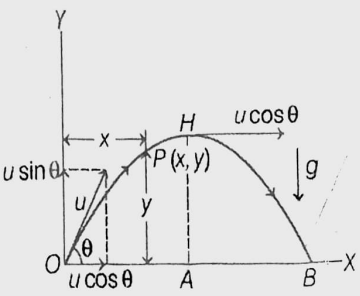
(i). The position of particle at t = 0,
(a) 14 m. (b) 18 m (c) 20 m (d) 25 m

(ii). Velocity of particle at t = 2 s
(a) -15 m/s (b) 1 m/s (c) 3 m/s (d) 31 m/s

(iii). Acceleration of particle at t = 2 s
(a) 0 ms^{-2} (b) 8 ms^{-2} (c) 10 ms^{-2} (d) 20 ms^{-2}

(iv). The particle has a uniform acceleration 'a 'when
(a) acceleration does not depend on time t (b) acceleration depends on time t
(c) velocity changes by unequal amount in equal interval of time, (d) None of these

Q23: Projectile motion is a form of motion in which an object or particle is thrown with some initial velocity near the earth's surface and it moves along a curved path under the action of gravity alone. The path followed by a projectile is called its trajectory, which is shown below. When a projectile is projected obliquely, then its trajectory is as shown in the figure below. Here velocity u is resolved into two components, we get (a) u cosθ along OX and (b) u sinθ along OY .



(i) The example of such type of motion is
(a) motion of car on a banked road (b) motion of boat in sea
(c) a javelin thrown by an athlete (d) motion of ball thrown vertically upward

(ii) The acceleration of the object in horizontal direction is
(a) constant (b) decreasing (c) increasing (d) zero

(iii) A cricket ball is thrown at a speed of 28 m/s in a direction 30° with the horizontal. The time taken by the ball to return to the same level will be
(a) 2.0 s (b) 3.0 s (c) 4.0 s (d) 2.9 s

(iv) In above case, the distance from the thrower to the point where the ball returns to the same level will be
(a) 39 m (b) 69 m (c) 68 m (d) 72m