No of printed Pages: 03

**INDIAN SCHOOL SOHAR**
**UNIT TEST I - 2024-25**
**PHYSICS (042)**
**SET-1**

**CLASS: XI** **Max Marks: 20**
**DATE: 19-05-2024** **Time: 45 Minutes**

**General Instructions:**

(i) There are 10 questions in all. All questions are compulsory.
(ii) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
(iii) Section **A** contains **six** questions of **one** mark each, Section **B** contain **one** question of **two** marks, Section **C** contain **one** question of **three** marks, Section **D** contains **one case study-based** question of **four** marks and Section **E** contain one question of **five** marks.
(iv) There is no overall choice. However, an internal choice has been provided in one question of five mark. You have to attempt only one of the choices in such questions.

**Section - A**

All questions are compulsory. In case of internal choices, attempt any one of them.

| | | |
|---|---|---|
| 1 | Which pairs do not have equal dimensions?<br>(a) Force and impulse (b) Elastic modulus and pressure<br>(c) Energy and torque (d) Angular momentum and Planck's constant | 1 |
| 2 | Given that the displacement of an oscillating particle is given by y = A sin (Bx + Ct + D). The dimensional formula for (ABCD) is:<br>(a) $[M^0L^{-1}T^{-1}]$ (b) $[M^0L^0T^0]$ (c)$[M^0L^{-1}T^0]$ (d) $[M^0L^0T^{-1}]$ | 1 |
| 3 | When a particle moves with variable velocity, which of the following statements are not correct<br>(I) Average speed = average velocity (II) Instantaneous speed = instantaneous velocity<br>(III) Distance covered = magnitude of displacement<br>(a) I, II, III (b) I, II (c) II, III (d) I, III | 1 |
| 4 | A particle moving in a straight line covers half the distance with speed of 3 m/s. The other half of the distance is covered in two equal time intervals with speed of 4.5 m/s and 7.5 m/s respectively. The average speed of the particle during this motion is<br>(a) 4.0 m/s (b) 5.0 m/s (c) 5.5 m/s (d) 4.8 m/s | 1 |

Two statements are given-one labelled Assertion **(A)** and the other labelled Reason**(R)**. Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.
a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true and R is not the correct explanation of A.
c) A is correct but R is incorrect d) A is incorrect and R is also incorrect.

| | | |
|---|---|---|
| 5 | **Assertion:** Number of significant figures in 0.005 is one and that in 0.500 is three.<br>**Reason:** This is because zeros are not significant. | 1 |
| 6 | **Assertion:** 'Light year' and 'Wavelength' both measure distance.<br>**Reason:** Both have dimension of time. | 1 |

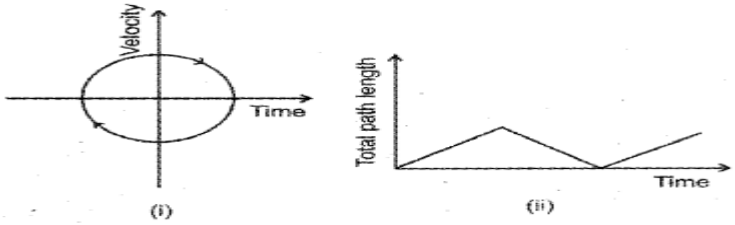
**Section - B**

| | | |
|---|---|---|
| 7 | Mechanical power is represented by $P - F v + Av^3p$ where, F is the force, v is the velocity, A is the area and ρ is the density.<br>a) The dimensional formula of power is… b) Check the dimensional validity of the above equation. | 2 |

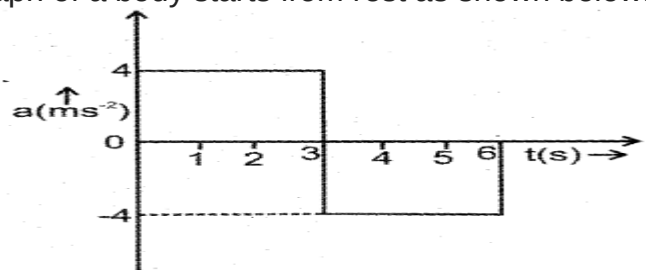
**Section - C**

| | | |
|---|---|---|
| 8 | i) Graph representing the motion of two bodies are shown below. State with reason whether it can | |

represent one dimensional motion.




ii) Acceleration – time graph of a body starts from rest as shown below:




a) What is the use of the acceleration – time graph?
b) Draw the velocity-time graph using the above graph.
c) Find the displacement in the given interval of time from 0 to 3 seconds. | 3

**Section - D (CASE STUDY)**

9 **Read the following text and answer the following questions on the basis of the same:**

Significant figures in the measured value of a physical quantity tell the number of digits in which we have confidence. Larger the number of significant figures obtained in a measurement, greater is the accuracy of measurement and vice – versa. In addition, or subtraction, the number of decimal places in the result should equal the smallest number of decimal places in any term in the operation. In multiplication and division, the number of significant figures in the product or in the quotient is the same as the smallest number of significant figures in any of the factors. With the help of above comprehension, choose the most appropriate alternative for each of the following questions:

i) The area enclosed by a circle of diameter 1.06 m with correct number of significant figures is

(a) 0.88 $m^2$ (b) 1.88 $m^2$ (c) 0.883 $m^2$ (d) 0.882026 $m^2$

ii) The circumference of the circle of diameter 1.06 m with correct number of significant figures is

(a) 3.33 m (b) 3.3 m (c)3.33142 m (d)3 m

iii) Subtract 2.6x $10^4$ from 3.9x $10^5$ with due regard to significant figures.

(a) 3.64 x $10^5$ (b) 3.6 x $10^5$ (c) 3.7 x $10^5$ (d) 3.65 x $10^6$

iv) Add 3. 8x $10^{-6}$ to 4.2 x $10^{-5}$ with due regard to significant figures.

(a) 4.6 x$10^{-5}$ (b) 4.58 x $10^{-5}$ (c) 4.6 x $10^{-6}$ (d) 4.580 x $10^{-5}$

**OR**

Two gold pieces each of mass 0.035g are placed in a box of mass 2.3 g. The total mass of the box with gold pieces is

(a) 2.3 g (b) 2.4 g (c) 2.37 g (d) 2.370g | 4

**Section - E**

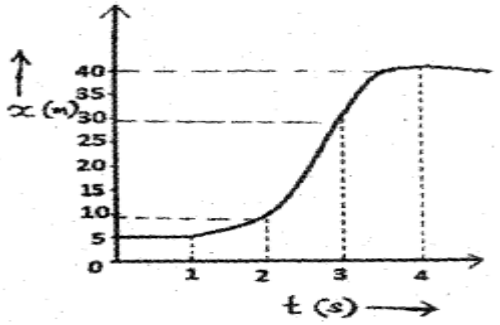
**In case of internal choices, attempt any one of them.**

i) Velocity is defined as the rate of change of displacement.

a) Distinguish between average velocity and instantaneous velocity.

b) When does the average velocity become equal to the instantaneous velocity?

ii) Position-time graph of a body is given



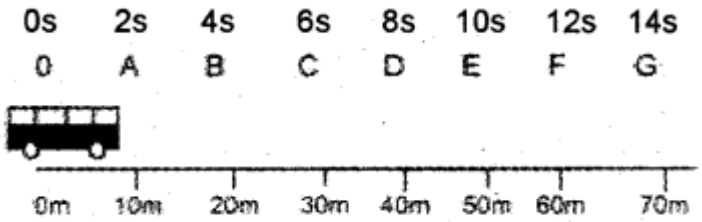

a) Estimate the velocity during the time interval t=2s to t = 3s.

b) Displacement of an object is proportional to $t^3$. Show that its acceleration is increasing with time

5

**OR**

ii) Figure given below shows the motion of a school bus starting from the point 0 and travels along a straight line




a) Complete the following table:

| *Time taken* | *Displacement* | *Velocity from 0* |
|---|---|---|
| *2 S* | *10 - 0 = 10 m* | ..... |
| *10 S* | ..... | *5 m/s* |

b) Is the motion of the bus uniform or non-uniform? Justify your answer.

c) Draw the position-time graph of the above motion.

d) A student in the school bus notices the speedometer of the bus. Which type of speed is shown by the speedometer?

e) If 'v' is the velocity and 'a' is the acceleration, give an example of a physical situation for each of the following cases. a) $v \neq 0, a = 0$. b) $v = 0, a \neq 0$. c) $v > 0, a < 0$. d) $v < 0, a > 0$.