



**INDIAN SCHOOL SOHAR**  
**UNIT TEST I - 2024-25**  
**PHYSICS (042)**  
**SET-2**

No of printed Pages: 03

**CLASS: XI**  
**DATE: 19-05-2024**

**Max Marks: 20**  
**Time: 45 Minutes**

**General Instructions:**

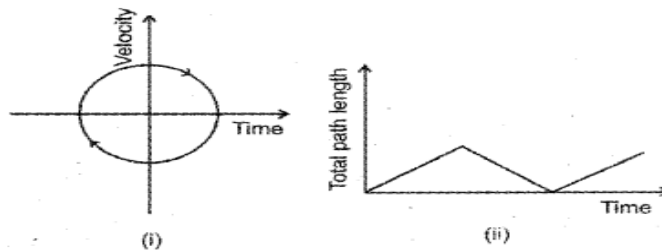
- (i) There are 10 questions in all. All questions are compulsory.
- (ii) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
- (iii) Section **A** contains **six** questions of **one** mark each, Section **B** contain **one** question of **two** marks, Section **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**

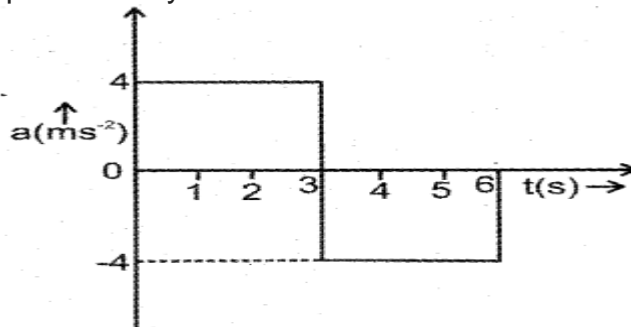
All questions are compulsory. In case of internal choices, attempt any one of them.

1	The dimensions of universal gravitational constant are (a) $M^2L^{-2}T^{-2}$ (b) $M^1L^3T^{-2}$ (c) $M^1L^{-1}T^{-2}$ (d) $M^1L^2T^{-2}$	1
2	The period of a body under SHM i.e. presented by $T = P^a D^b S^c$ ; where P is pressure, D is density and S is surface tension (surface tension is equal to force per unit length). The value of a, b and c are a) $-3/2, 1/2, 1$ (b) $-1, -2, 3$ (c) $1/2, 3/2, 1/2$ (d) $1, 2, 1/3$	1
3	A Body moves 6 m north. 8 m east and 10 m vertically upwards, what is its resultant displacement from initial position (a) $10\sqrt{2}$ m                      (b) 10 m                      (c) $10/\sqrt{2}$ (d) $10 \times 2$ m	1
4	The correct statement from the following is (a) A body having zero velocity will not necessarily have zero acceleration (b) A body having zero velocity will necessarily have zero acceleration (c) A body having uniform speed can have only uniform acceleration (d) A body having non-uniform velocity will have zero acceleration	1
Two statements are given-one labelled Assertion ( <b>A</b> ) and the other labelled Reason( <b>R</b> ). 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: A body can have acceleration even if its velocity is zero at a given instant of time. Reason: A body is momentarily at rest when it reverses its direction of motion.	1
6	Assertion: The average velocity of the object over an interval of time is either smaller than or equal to the average speed of the object over the same interval. Reason: Velocity is a vector quantity and speed is a scalar quantity.	1
<b>Section - B</b>		
7	Mechanical power is represented by $P = Fv + Av^3\rho$ where, F is the force, v is the velocity, A is the area and $\rho$ is the density. a) The dimensional formula of power is...    b) Check the dimensional validity of the above equation.	2
<b>Section - C</b>		
8	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:



- What is the use of the acceleration – time graph?
- Draw the velocity-time graph using the above graph
- 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<sup>2</sup>      (b) 1.88 m<sup>2</sup>      (c) 0.883 m<sup>2</sup>      (d) 0.882026 m<sup>2</sup>

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  $2.6 \times 10^4$  from  $3.9 \times 10^5$  with due regard to significant figures.

- (a)  $3.64 \times 10^5$       (b)  $3.6 \times 10^5$       (c)  $3.7 \times 10^5$       (d)  $3.65 \times 10^6$

iv) Add  $3.8 \times 10^{-6}$  to  $4.2 \times 10^{-5}$  with due regard to significant figures.

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

**OR**

Two gold pieces each of mass 0.035g are placed in a box with gold piece is

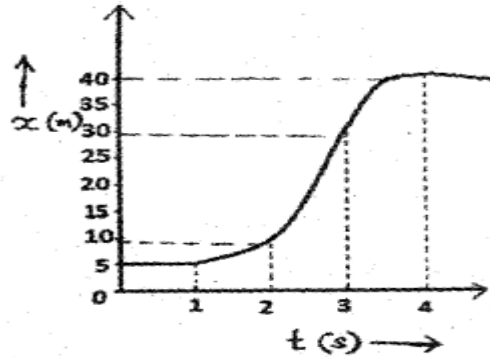
- (a) 2.3 g      (b) 2.4 g      (c) 2.37g      (d) 2.370 g

4

**Section - E**

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

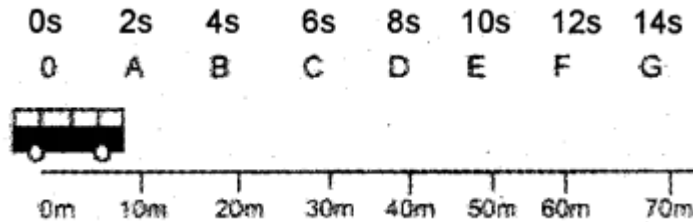
- i) Velocity is defined as the rate of change of displacement.  
 a) Distinguish between average velocity and instantaneous velocity.  
 b) When does the average velocity become equal to the instantaneous velocity?  
 ii) Position-time graph of a body is given



- 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

OR

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:

<i>Time taken</i>	<i>Displacement</i>	<i>Velocity from 0</i>
<b>2 S</b>	<b>10 - 0 = 10 m</b>	.....
<b>10 S</b>	.....	<b>5 m/s</b>

- 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)  $v < 0, a > 0$ .