

**TEST NO. 2****CH - 2****PHYSICS****Time Allowed: 15 Minutes****CLASS 9<sup>TH</sup> - 019****Paper: (Objective Type)****Maximum Marks: 12**

Note : You have four choices for each objective type question as A , B, C and D. The choice which you think is Correct, fill that circles 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.  | QUESTIONS                                                                                       | (A)                  | (B)                      | (C)                   | (D)                 |
|-----|-------------------------------------------------------------------------------------------------|----------------------|--------------------------|-----------------------|---------------------|
| 1.  | The unit of velocity and speed is                                                               | ms                   | ms <sup>-2</sup>         | ms <sup>-3</sup>      | ms <sup>-1</sup>    |
| 2.  | When the velocity and the acceleration are in the same direction, then the acceleration will be | Uniform              | Positive                 | Negative              | Equal               |
| 3.  | Which of the following is a vector quantity?                                                    | Speed                | Distance                 | Displacement          | Power               |
| 4.  | The unit of acceleration is.                                                                    | ms <sup>-1</sup>     | ms                       | ms <sup>-2</sup>      | ms <sup>2</sup>     |
| 5.  | Displacement is a quantity.                                                                     | Scalar               | Vector                   | Both a & b            | None of theses      |
| 6.  | If an object is moving with a uniform changing speed then speed time graph is.                  | Straight             | Variable                 | Parallel to time axis | All of theses       |
| 7.  | A Train is moving at a speed 36 kmh. Its speed expressed in m-s <sup>-1</sup>                   | ±10 ms <sup>-1</sup> | 20 ms <sup>-1</sup>      | 25ms <sup>-1</sup>    | 30 ms <sup>-1</sup> |
| 8.  | The slop of speed time graph is called.                                                         | Distance             | Displacement             | Velocity              | Acceleration        |
| 9.  | The motion of a body about an axis is called.                                                   | Circular motion      | Rotatory motion          | Vibratory motion      | Random motion.      |
| 10. | The second equation of motion is                                                                | F=ma                 | S=vit+1/2at <sup>2</sup> | V=vf+vi/2             | Vf=vi+at            |
| 11. | A ball is thrown vertically upward. Its velocity at the highest point is.                       | 10 ms <sup>-1</sup>  | -10ms <sup>-1</sup>      | 10ms <sup>-2</sup>    | Zero                |
| 12. | The value of gravitational acceleration when a body is moving in downward direction is.         | 10 ms <sup>-1</sup>  | 10 ms <sup>-2</sup>      | 10 m                  | 10 ms               |

**A B C D****A B C D****A B C D****A B C D****A B C D**

|   |                 |   |                 |   |                 |    |                 |    |                 |
|---|-----------------|---|-----------------|---|-----------------|----|-----------------|----|-----------------|
| 1 | (A) (B) (C) (D) | 4 | (A) (B) (C) (D) | 7 | (A) (B) (C) (D) | 10 | (A) (B) (C) (D) | 13 | (A) (B) (C) (D) |
| 2 | (A) (B) (C) (D) | 5 | (A) (B) (C) (D) | 8 | (A) (B) (C) (D) | 11 | (A) (B) (C) (D) | 14 | (A) (B) (C) (D) |
| 3 | (A) (B) (C) (D) | 6 | (A) (B) (C) (D) | 9 | (A) (B) (C) (D) | 12 | (A) (B) (C) (D) | 15 | (A) (B) (C) (D) |

نوٹ: معروضی سوال نامے کو توجہ سے پڑھیں اور ہر MCQ کی درست آپشن A, B, C, D کو پین کی سیاہی یا مارکر سے اس طرح پُر کریں کہ سیاہی دائرے سے باہر نہ نکلے۔ ایک سے زیادہ دائروں کو پُر کرنے یا کاٹ کر پُر کرنے کی صورت میں مذکورہ جواب غلط تصور ہوگا۔

## (PART - I)

## 2. Write short answers to any Five (5) questions:

10

- Define kinematics.
- What is the equation of motion?
- Define Gravitational Acceleration.
- Sketch a graph of body moving with uniform acceleration.
- Sketch a graph of object moving with constant speed.
- Define random motion and give example.
- Convert  $50\text{kmh}^{-1}$  speed of a body into  $\text{ms}^{-1}$
- A car starts from rest. Its velocity becomes  $20\text{ms}^{-1}$  in 8 s. Find the acceleration.

## 3. Write short answers to any Five (5) questions:

10

- Differentiate between speed and velocity.
- Define uniform speed and uniform velocity.
- Differentiate between distance and displacement.
- Define rest and motion.
- Write types of motion.
- Difference between scalar and vector.
- Define vibratory motion and give example.
- How is a vector represented?

## 4. Write short answers to any Five (5) questions:

10

- Define rotatory motion. With example.
- Define circular motion. With example.
- What do you know about position?
- Define vector and write the name of two methods of vector quantities, representation.
- Define acceleration and write its formula.
- What is meant by positive and negative acceleration?
- Can a body moving at a constant speed have acceleration?
- Define Uniform acceleration.

## (PART - II)

Note : Attempt any TWO questions.

- Prove that  $s = vit + \frac{1}{2}at^2$  4
  - A train starts from rest with an acceleration of  $0.5\text{ms}^{-2}$ . Find the speed in  $\text{kmh}^{-1}$ , when it has moved through 100m 5
- Difference between Scalars and Vectors quantities. 4
  - A cricket ball is hit vertically upward and returns to ground 6 s later. Calculate (i) maximum height reached by the ball. (ii) Initial velocity of the ball. 5
- Differentiate between distance and displacement. 4
  - A stone is dropped from the top of a tower. The stone hits the ground after 5 second. Find a) The height of the tower b) The velocity with which the stone hits the ground 5



# PHYSICS

## (PART - I)

### Question: 2

Write short answers to any five questions:

(i) Define kinematics.

Kinematics :-

The study of motion of objects without discussing the cause of motion is called kinematics.

(ii) What is the equation of motion?

Equation of Motion:-

Equations of motion for uniformly accelerated motion are

1-  $V_f = V_i + at$

2-  $S = V_i t + \frac{1}{2} at^2$

3-  $2aS = V_f^2 - V_i^2$

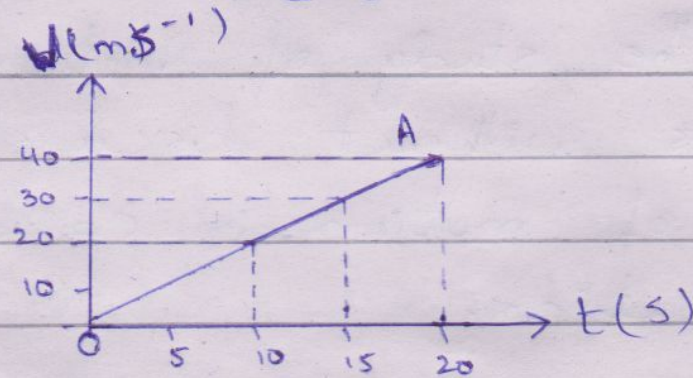
(iii) Define gravitational acceleration.

The acceleration of a freely falling bodies is called

gravitational acceleration. Its value is  $10 \text{ ms}^{-2}$ .

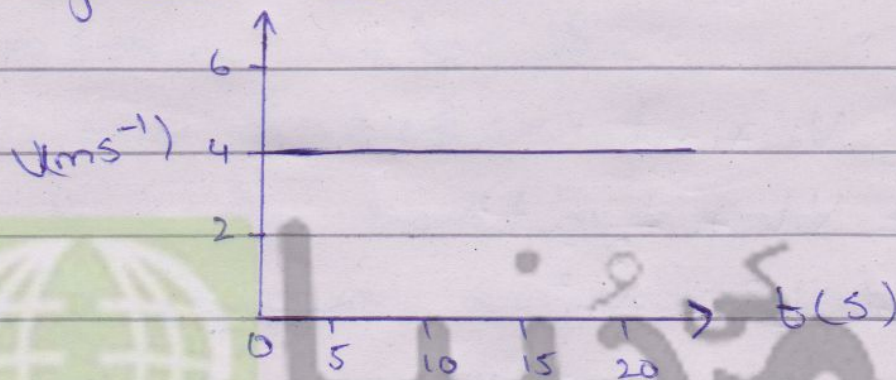
(iv) Sketch a graph of body moving with uniform acceleration.

The graph of the body moving with uniform acceleration is given below:



(v) Sketch a graph of object moving with constant speed.

The graph of the object moving with constant speed is given below:



(vi) Define random motion and give example.

## Random Motion :-

The disordered or irregular motion of an object is called random motion. For example, the motion of insects and birds.

(Vii) Convert  $50 \text{ km h}^{-1}$  speed of a body into  $\text{ms}^{-1}$ .

$$\begin{aligned}\text{Speed of the body} &= 50 \text{ km h}^{-1} \\ &= \frac{50 \times 1000}{3600} \text{ ms}^{-1}\end{aligned}$$

$$= 13.89 \text{ ms}^{-1} \quad \text{Ans.}$$

(Viii) A car starts from rest. Its velocity becomes  $20 \text{ ms}^{-1}$  in 8s. Find the acceleration.

$$V_i = 0 \text{ ms}^{-1}$$

$$V_f = 20 \text{ ms}^{-1}$$

$$t = 8 \text{ s}$$

$$a = ?$$

We know that

$$a = \frac{V_f - V_i}{t}$$

Putting values, we get

$$a = \frac{20 - 0}{8}$$

$$a = \frac{20}{8} = 2.5$$

$$a = 2.5 \text{ ms}^{-2}$$

Ans =

Question : 3

Write short answers to any five questions:

(i) Differentiate between speed and velocity.

Speed :-

The distance covered by an object in unit time is called its speed.

Velocity :-

The rate of displacement of a body is called its velocity.

(ii) Define uniform speed and uniform velocity.

Uniform Speed :-

A body has uniform speed if it covers equal distance in equal intervals of time however short the interval may be.

## Uniform Velocity :-

A body has uniform velocity if it covers equal displacement in equal intervals of time however short the interval may be.

(iii)

Differentiate between distance and displacement.

| Distance                                                                         | Displacement                                                                                |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| length of a path between two points is called the distance between those points. | Displacement is the shortest distance between two points which has magnitude and direction. |

(iv)

Define rest and motion.

Rest :-

A body is said to be at rest if it does not change its position with respect to its surroundings.

Motion :-

A body is said to be in

motion if it changes its position with respect to its surroundings.

(iv) Write types of motion.

Types of Motion :-

There are three types of motion.

1- Translatory motion.

2- Rotatory motion.

3- Vibratory motion.

(vi) Difference between scalar and vector.

Scalar

Vector.

1- A scalar quantity is described completely by its magnitude only.

A vector quantity is described completely by magnitude and direction.

2- Mass, length, time etc are examples of scalars.

Velocity, force, displacement are examples of vectors.

(vii) Define vibratory motion and

give example.

Vibratory Motion :-

To and fro motion of a body about its mean position is known as vibratory motion.

Example :

Motion of a see-saw.

(viii) How is a vector represented?

Graphically a vector can be represented by a line segment with a arrow head which represents its direction and the length of line segment gives its magnitude according to selected scale.

Question : 4

(i) Write short answers to any five questions:

Define rotatory motion. With example.

Rotatory Motion :-

The spinning motion of a body about its axis is called rotatory motion.

Examples:

Motion of top, motion of ceiling fan.

(ii) Define circular motion. With example.

Circular Motion:-

The motion of a object in a circular path is known as circular motion.

Example:

Motion of earth around sun.

(iii) What do you know about position?

Position:-

The term position describes the location of a place or a point with respect to some reference point called origin.

(iv) Define vector and write the name of two <sup>methods of</sup> vector quantities, representation.

## Vector :-

A vector quantity is described completely by magnitude and direction.

## Methods of Vector Representation :-

There <sup>are</sup> two methods of vector representation.

- 1- Symbolic representation
- 2- Graphical representation

(V) Define acceleration and write its formula.

### Acceleration :-

The rate of change of velocity of a body is called acceleration.

### Formula :

$$a = \frac{V_f - V_i}{t}$$

(Vi) What is meant by positive and negative acceleration?

### Positive acceleration :-

Acceleration of a body is positive if its velocity increases with time.

## Negative acceleration:-

Deceleration of a body is negative if velocity of the body decreases.

(Nii) Can a body moving at a constant speed have acceleration?

Yes, when a body moves along a circular path with constant speed it has acceleration due to centripetal force.

(Niii) Define uniform acceleration.  
Uniform acceleration:-

A body has uniform acceleration if it has equal changes in velocity in equal intervals of time however shorter the interval may be.

## (PART - II)

Attempt any two questions.

Question : 5(a)

Prove that

$$S = V_i t + \frac{1}{2} a t^2$$

## Second Equation of Motion:-

The total distance  $S$  travelled by the body is equal to the total area  $OABD$  under the graph. That is

Total distance  $S = \text{area of (rectangle } OACD + \text{triangle } ABC.)$

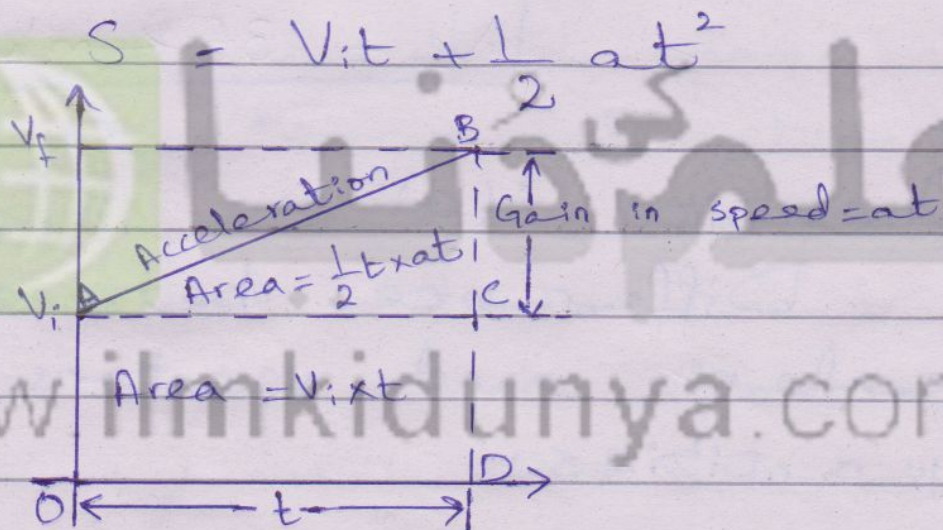
$$\begin{aligned}\text{Area of } OACD &= OA \times OD \\ &= V_i \times t\end{aligned}$$

$$\begin{aligned}\text{Area of } ABC &= \frac{1}{2} (AC \times BC) \\ &= \frac{1}{2} (t \times at)\end{aligned}$$

Since

Total area = Area of rectangle  $OACD$  +  
 $OABD$  area of triangle  $ABC$ .  
putting values in the above  
equation, we get

$$S = V_i t + \frac{1}{2} at^2$$



Question : 5(b)

A train starts from rest with an acceleration of  $0.5 \text{ ms}^{-2}$ . Find the Speed in  $\text{kmh}^{-1}$ , when it has moved through 100m.

Given Data:-

$$V_i = 0 \text{ ms}^{-1}$$

$$a = 0.5 \text{ ms}^{-2}$$

$$S = 100 \text{ m}$$

$$V_f = ?$$

Calculation:-

$$2aS = V_f^2 - V_i^2$$

$$2(0.5)(100) = V_f^2 - 0^2$$

$$100 \text{ ms}^{-2} = V_f^2 - 0$$

$$100 \text{ ms}^{-2} = V_f^2$$

$$\Rightarrow \sqrt{V_f^2} = \sqrt{100 \text{ m}^2 \text{ s}^{-2}}$$

$$V_f = 10 \text{ ms}^{-1}$$

$$= \frac{10 \times 3600}{1000}$$

$$= 36$$

$$\boxed{V_f = 36 \text{ kmh}^{-1}} \quad \text{Ans.}$$

Question: 6(a)

Difference between scalars and vectors quantities.

## Scalars Quantities :-

"A scalar quantity is described completely by its magnitude only."

### Explanation :-

A physical quantity which can be completely described by its magnitude is called a scalar. The magnitude of a quantity means its numerical value with an appropriate unit such as 2.5 kg, 40 s, 1.8 m, etc.

### Examples :-

Examples of scalars are mass, length, time, speed, volume, work and energy.

## Vectors Quantity :-

"A vector quantity is described completely by magnitude and direction."

### Explanation :-

A vector can be described completely by

magnitude alongwith its direction. It would be meaningless to describe vectors without direction.

### Examples :-

Distance of a place from reference point is insufficient to locate that place. The direction of that place from reference point is also necessary to locate it.

Examples of vectors are velocity, displacement, force, momentum, torque etc.

### Question : 6(b)

A cricket ball is lit vertically upwards and returns to ground 6s later. Calculate

- (i) maximum height reached by the ball.
- (ii) Initial velocity of the ball.

Given Data:-

$$t = 6s = \frac{6}{2} = 3s$$

$$h = ?$$

$$V_i = ?$$

$$V_f = 0$$

$$g = -10 \text{ m s}^{-2}$$

Solution :-

(ii)

$$V_f = V_i + gt$$

putting values

$$0 = V_i + (-10)(3)$$

$$0 = V_i - 30 \text{ m s}^{-1}$$

$$\boxed{V_i = 30 \text{ m s}^{-1}}$$

(i)

$$h = V_i t + \frac{1}{2} g t^2$$

$$h = 30(3) + \frac{1}{2} (-10)(3)^2$$

$$= 90 - \frac{90}{2}$$

$$= 90 - 45$$

$$\boxed{h = 45 \text{ m}}$$

Ans.

Question : 7(a)

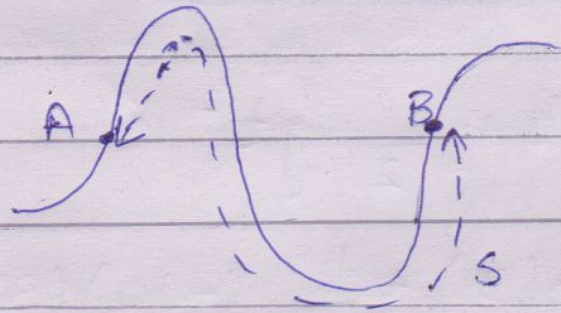
Differentiate between distance and displacement.

## Distance :-

Length of a path between two points is called the distance between those points.

## Explanation:-

Let  $S$  be the length of the curved path between two points  $A$  and  $B$  on it. Then  $S$  is the distance between points  $A$  and  $B$ .



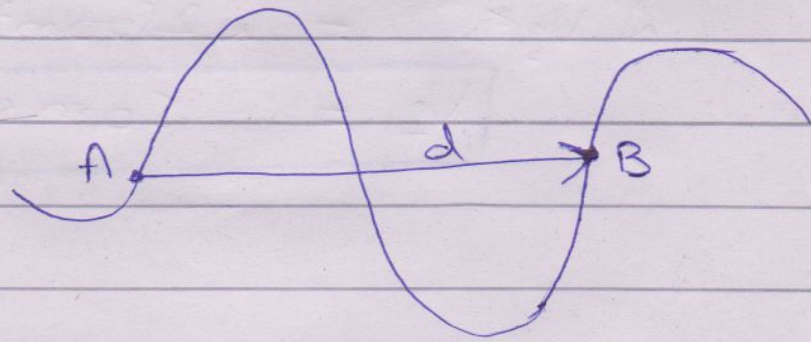
## Displacement :-

"Displacement is the shortest distance between two points which has magnitude and direction."

## Explanation:-

Consider a body that moves from point  $A$  to point  $B$  along the curved path.

Join points A and B by a straight line. The straight line AB gives the distance which is the shortest between A and B. This shortest distance has magnitude  $d$  and direction from point A to B. This shortest distance  $d$  in a particular direction is called displacement. It is a vector quantity and is represented by  $\vec{d}$ .



Question : 7(b)

Given Data :-

$$V_i = 0$$

$$g = 10 \text{ m s}^{-2}$$

$$t = 5 \text{ s}$$

$$S = h = ?$$

$$V_f = ?$$

Solution :-

$$h = V_i t + \frac{1}{2} g t^2$$

putting values

$$h = 0 \times 5 + \frac{1}{2} (10)(5)^2$$

$$= 0 + 125$$

$$\boxed{h = 125 \text{ m}}$$

$$V_f^2 - V_i^2 = 2gh$$

$$V_f^2 - 0^2 = 2 \times 10 \times 125$$

$$V_f^2 = 2500 \text{ m}^2 \text{ s}^{-2}$$

$$\sqrt{V_f^2} = \sqrt{2500 \text{ m}^2 \text{ s}^{-2}}$$

$$\boxed{V_f = 50 \text{ m s}^{-1}}$$

Ans.



علم دُنیا

www.ilmkidunya.com