|	INDIAN SCHOOL AL WADI AL KABIR	
Class: IX	**DEPARTMENT OF SCIENCE -2022-23** **SUBJECT: PHYSICS**	DATE OF COMPLETION: 23.05.2022
WORKSHEET NO:2 WITH ANSWERS	**TOPIC: MOTION-PART 2**	**A4 FILE FORMAT** **(PORTFOLIO)**
CLASS & SEC:	**NAME OF THE STUDENT:**	**ROLL NO.**

OBJECTIVE TYPE QUESTIONS

1. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of 10 ms^{-1} It implies that the boy is
   (a) at rest   (b) moving with no acceleration
   (c) in accelerated motion   (d) moving with uniform velocity

2. From the given v-t graph, it can be inferred that the object is
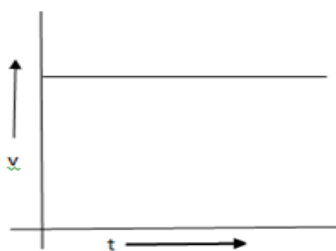
   (a) At rest   (b) In uniform motion
   (c) Moving with uniform acceleration   (d) In non-uniform motion

3. According to the given velocity-time graph, the object
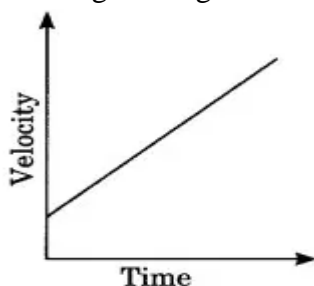
   (a) is moving with uniform velocity   (b) has some initial velocity
   (c) is moving uniformly with some initial velocity   (d) is at rest

4. The speed - time graph of a car is given here. Using the data in the graph calculate the total distance covered by the car.
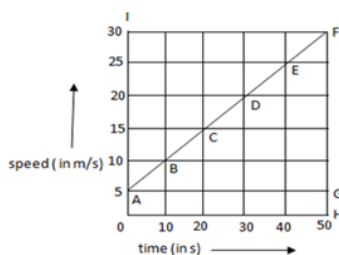
    (a) 1250 m   (b) 875 m
    (c) 1500 m   (d) 870 m

5. Four cars A, B, C and D are moving on a levelled, straight road. Their distance time graphs are shown in the figure below. Which of the following is the correct statement regarding the motion of these cars?
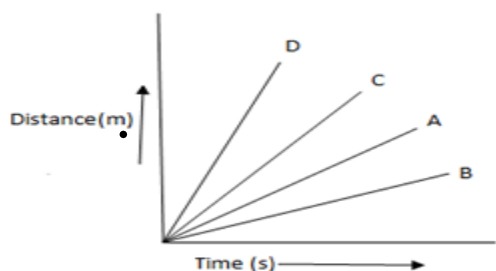
    (a) Car A is faster than car D   (b) Car B is the slowest
    (c) Car C is faster than car D   (d) Car C is the slowest

ASSERTION AND REASONING

6. Assertion: Uniform circular motion is accelerated motion
   Reason: The accelerated motion of an object may be due to change in magnitude of velocity or direction or both of them.

7. Assertion : An object may acquire acceleration even if it is moving at a constant speed.
   Reason : With change in the direction of motion, an object can acquire acceleration.

8. Assertion : Position-time graph of a stationary object is a straight line parallel to time axis.
   Reason : For a stationary object, position does not change with time.

ONE MARK TYPE QUESTIONS

9. The speed of a particle is constant. Will it have acceleration? Justify with an example
10. A particle moves in a circle of diameter 10m. The distance covered by it in 2 complete revolutions is
11. What would be acceleration of a body if its velocity-time graph is a line parallel to the time axis?
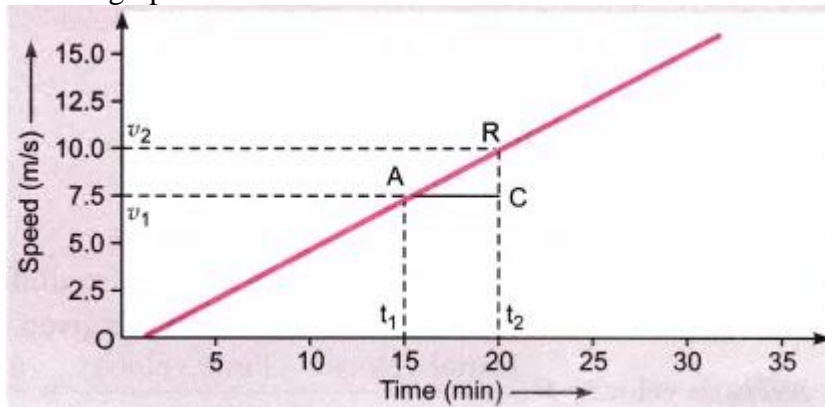
TWO MARKS TYPE QUESTIONS

12. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metre, calculate his speed. (Given $\pi=22/7$)
13. Draw a velocity versus time graph of a stone thrown vertically upwards and then coming downwards after attaining the maximum height.
14. Distance travelled by a train and time taken by it is shown in the following table, (i) Plot distance-time graph.

| Time	Distance (in km)
10:00 AM	0
10:30 AM	25
10:40 AM	28
11:00 AM	40
11:15 AM	42
11:30 AM	50

THREE MARKS TYPE QUESTIONS

15. i. Name a physical quantity which (a) varies (b) remains constant, when a body moves in a uniform circular motion.

    ii. Is a satellite moving around the earth in a circular orbit accelerated? Explain

16. Write equations of motion for a body starting from rest and moving with constant acceleration.

17. Given below is the velocity-time graph for the motion of the car. What does the nature of the graph show ? Also find the acceleration of the car.


FIVE MARKS TYPE QUESTIONS

18. Study the speed-time graph of a body given here and answer the following questions:
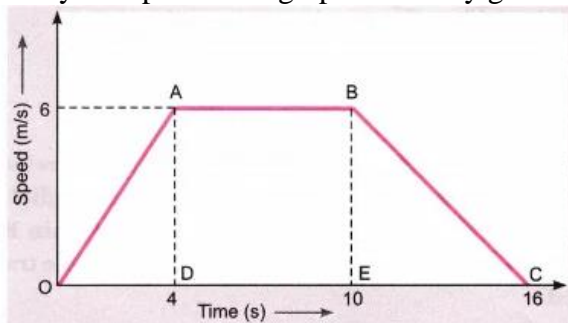
    (a) What type of motion is represented by OA?
    (b) What type of motion is represented by AB?
    (c) What type of motion is represented by BC?
    (d) Find out the acceleration of the body.
    (e) Calculate the retardation of the body.
    (f) Find out the distance travelled by the body from A to B.

19. The graph given below shows the positions of a body at different times. Calculate the speed of the body as it moves from
    (i) A to B
   (ii) B to C and
    (iii) C to D.
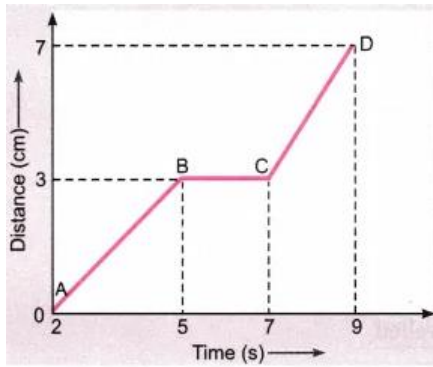
PREVIOUS YEAR BOARD QUESTIONS

20. An artificial satellite is moving in a circular orbit of radius 36,000km. Calculate its speed if it takes 24 hours to revolve around the earth   (CBSE 2012)

21. What will you say about the motion of a body if its distance-time graph is a straight line having a constant angle with time axis?   CBSE 2010

CASE STUDY QUESTION

22. The variation in velocity with time for an object moving in a straight line can be represented by a velocity-time graph. In this graph, time is represented along the x-axis and the velocity is represented along the y-axis.The following case is the velocity-time graph for the motion of a car. The nature of the graph shows that velocity changes by equal amounts in equal intervals of time. Thus, for all uniformly accelerated motion, the velocity-time graph is a straight line.
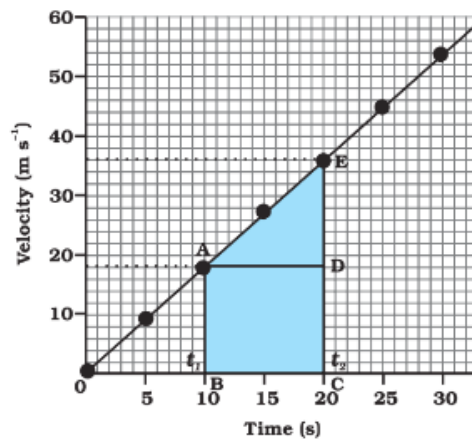
i. What does the slope of velocity-time give?
(a)distance
(b)acceleration
(c)force
(d)velocity
ii. In the graph shown the car is moving with:
(a)constant acceleration
(b)zero velocity
(c)variable acceleration
(d)zero acceleration
iii. The velocity of the car at point E is
(a)36m/s
(b)20m/s
(c)40m/s

(d)50m/s

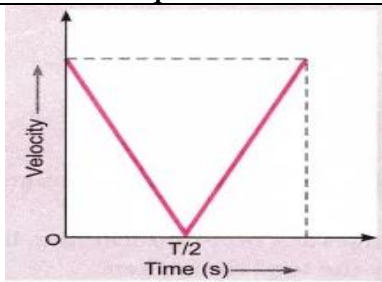iv. Find the distance covered by the body during the interval from 10s to 20s

(a)200m

(b)270m

(c)360m
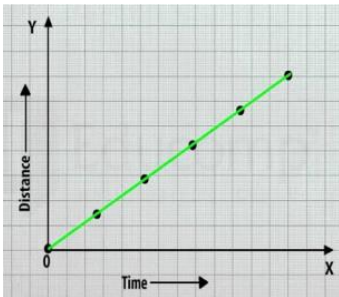
(d)400m

ANSWERS

1.	*Ans:- (c) in accelerated motion*
2.	*Ans:- (b)* *In uniform motion*
3.	*Ans:- (b) has some initial velocity*
4.	Ans:- (*b*) *875 m (Hint:- distance= area under speed time graph=area of triangle AGH+ area of rectangle AGHO)*
5.	*Ans:- (b) Car B is the slowest*
6.	*Ans : (a) Both assertion and reason are true and reason is the correct explanation of assertion*
7.	*Ans : (a) Both assertion and reason are true and reason is the correct explanation of assertion*
8.	Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
9.	*Ans:- If speed of particle is constant then the particle may have acceleration or not.If direction of the particle changes with constant speed then there is acceleration, and if direction doesn't changes there is no acceleration.*
10.	*Ans:- 2 ×2πr=20π*
11.	Ans : Zero, as the body possesses uniform velocity.
12.	*ANS:-Given :-* *Radius , r = 105 m* *time, t = 2min = 120 second* *Circumference or distance of circle = 2πr ⇒2×22/7×105⇒ 660 m* *∴ speed = distance / time ⇒660 m/ 120⇒5·5m/s*
13.	

14.	*(i)*
15.	***Ans:- i.(a) Velocity (b) Speed*** ***ii.Yes, because the direction of velocity of satellite is changing.***
16.	***Ans:- 1. v=at 2. $s=\frac{1}{2}at^2$ 3 $v^2=2as$***
17.	Ans:- The nature of the graph shows that velocity changes by equal amounts in equal intervals of time. For a uniformly accelerated motion, velocity-time graph is always a straight line. As we know, acceleration is equal to the slope of the graph i.e, $a = \dfrac{BC}{AC}$ or $a = \dfrac{v_2 - v_1}{t_2 - t_1}$ $\therefore$ $a = \dfrac{(10.0 - 7.5)\ \text{ms}^{-1}}{(20 - 15)\ \text{s}}$ or $a = \dfrac{2.5\ \text{ms}^{-1}}{5\ \text{s}}$ or $a = 0.5\ \text{ms}^{-2}$.
18.	Ans:- (a) OA is a straight line graph between speed and time, and it is sloping upward from O to A. Therefore, the graph line OA represents uniform acceleration. (b) AB is a straight line graph between speed and time, which is parallel to the time axis (x-axis). So, AB represents uniform speed. There is no acceleration from A to B. (c) BC is a straight line graph between speed and time which is sloping downwards from B to C. Therefore, BC represents uniform retardation or negative acceleration. (d) Acceleration of the body as we see from graph line OA represents it. So, the slope of velocity-time graph OA will give the acceleration of the body. Thus, Acceleration = Slope of line OA = AD/OD We have, AD = 6 m/s, and OD = 4 s

	So, acceleration $= \frac{6m/s}{4s}$ = 1.5 m/s (e) The slope of line graph BC represents the retardation of the body. So, retardation = Slope of line BC = BE/EC We have, BE = 6m/s, EC = 16 – 10 = 6s Retardation $= \frac{6m/s}{4s}$ = 1m/s^2 (f) Distance travelled from A to B = Area under the line AB and the time axis = Area of rectangle DABE = DA × DE Here, DA = 6 m/s and DE = 10 – 4 = 6 s Distance travelled from A to B = 6 × 6 = 36m
19.	<u>Ans:-</u> (i) The distance-time graph represents the line AB which shows the speed of the body. So, Speed $= \frac{\text{Distance}}{\text{Time}} = \frac{3cm}{(5-2)s} = 1$ cm/s (ii) The distance-time graph shows that the body is at rest between graph line B to C, it means no movement. So speed is zero i.e., Speed $= \frac{\text{Distance}}{\text{Time}} = \frac{0}{(7-5)s} = \frac{0}{2s} = 0$ (iii) The distance-time graph represents the line CD which shows the speed of the body. So, Speed $= \frac{\text{Distance}}{\text{Time}} = \frac{(7-3)cm}{(9-7)s} = \frac{4cm}{2s} = 2$ cm/s
20.	*Ans:-* *r=36,000km* *t= 24hr* *Here v=2πr/t=2×3.14×36,000/24=9420km/hr*
21.	Ans:- Body is in uniform motion
22.	i. Ans:-(b) acceleration ii. Ans: - constant acceleration iii.Ans:-(a)36m/s iv. Ans:-270m

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