BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

PRE MID TERM EXAMINATION -2024-25

PHYSICS (042)

Class : XI
Date : 02/08/2024

Duration: **1 Hr**
Max. Marks: **25**

Instructions:

i. There are three sections A, B, and C with 13 questions in total, Section A has 3 Multiple Choice Questions and 2 Assertion Reasoning based Question of one mark each, Section B has 4 questions of two marks each and Section C has 4 questions of three marks each.
ii. All questions are compulsory.
iii. Calculators are not allowed.

Section A

1. The slope of the tangent drawn on position-time graph at any instant is equal to the instantaneous; 1
(a) acceleration (b) force (c) velocity (d) momentum
2. An object moves in a straight line with an initial velocity of 5 m/s. If it accelerates at a rate of 2 m/s² for 4 seconds, what is its final velocity? 1
(a) 9 m/s (b) 7 m/s (c) 13 m/s (d) 3 m/s
3. A train is moving with a constant speed of 72 km/h. How much time will it take to travel a distance of 360 km? 1
(a) 4 hours (b) 6 hours (c) 5 hours (d) 8 hours

For Questions 4 and 5, two statements are given –one labelled Assertion (A) and other labelled Reason (R). Select the correct answer to these questions from the options as given below.

(a) If both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

4. Assertion: Displacement of a body may be zero when distance travelled by it is not zero. 1
Reason: The displacement is the longest distance between initial and final position.

5. Assertion: Position-time graph of a stationary object is a straight line parallel to time axis. 1
   Reason: For a stationary object, position does not change with time.

Section B

6. Define non- uniform motion. Write one example of this motion. 2
7. A woman starts from her home at 9.00 am, walks with a speed of 5 km h^{-1} on a straight road up to her office 2.5 km away, stays at the office up to 5.00 pm, and returns home by an auto with a speed of 25 km h^{-1}. Choose suitable scales and plot the x-t graph of her motion. 2
8. Write two differences between velocity and speed. 2
9. Define average acceleration and instantaneous acceleration, write mathematical formula of each. 2

Section C

10. A passenger arriving in a new town wishes to go from the station to a hotel located 10km away on a straight road from the station. A dishonest cab man takes him along a circuitous path 23km long and reaches the hotel in 28min. What is…… 3
    (a) the average speed of the taxi?
    (b) The magnitude of average velocity? Are the two equal?
11. Derive the three equations of motion using graphical method. 3
12. A car moving along a straight highway with speed of 126 km h^{-1} is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform), and how long does it take for the car to stop? 3
13. The position of an object moving along x-axis is given by $x = a + bt^2$ where a = 8.5 m, b = 2.5 m s^{-2} and t is measured in seconds. What is its velocity at t = 0 s and t = 2.0 s. What is the average velocity between t = 2.0 s and t = 4.0 s? 3

----------All the Best----------