CBSE

MOTION WS 6

Class 09 - Science

Section A

1. A body moving in a circle of radius r covers $\frac{3}{4}$th of the circle. The ratio of the distance to displacement is: **[1]**

   a) 3 : $2\sqrt{2}$ b) 3π : $2\sqrt{2}$

   c) $3\sqrt{2}$: 2π d) $2\sqrt{2}$: 3π

2. When a body moves uniformly along the circle, then:- **[1]**

   a) its speed changes but velocity remain the same b) both speed and velocity changes

   c) both speed and velocity remain the same. d) its velocity changes but speed remain the same

3. Two racing cars of masses m_1 and m_2 are moving in circles of radii r_1 and r_2 respectively. Their speeds are such that each makes a complete circle in the same length of time T. The ratio of angular speed of the first car to that of the second car is **[1]**

   a) r_1 : r_2 b) 1 : 1

   c) m_1r_2, : m_1r_2 d) m_1 : m_2

4. A particle is moving in a circular path of radius r. The displacement after half a circle would be **[1]**

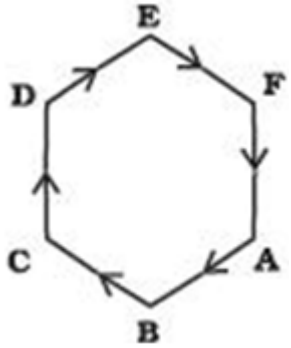
   a) 2r b) $2\pi r$

   c) πr d) zero

5. **State True or False:** **[1]**

   (a) When a body moves in a circle, it is called circular motion. **[1]**

6. If the athlete is running along the shown path ABCDEF, the athlete will have to change his direction six times while he completes one round. He is running on which path? **[1]**

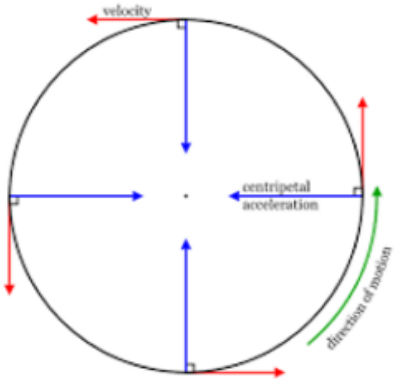


   a) Hexagonal path b) Trigonal path

   c) Heptagonal path d) Pentagonal path

7. The given image shows the motion of the moon around the earth. Which of the following statement/s is/are **[1]**

correct regarding the given image?



a) The velocity of an object changes
b) All of these
c) The speed of the object remains constant
d) A body moves in a circle

8. The maximum displacement between two points in a circular path can be _____. (Radius-r) **[1]**

a) 2r
b) r
c) πr
d) $2\pi r$

9. Which of the following is correct about uniform circular motion? **[1]**

A. The direction of motion is continuously changed.
B. The direction of motion is not changed.
C. Speed and direction both remain constant.
D. Speed is constant, but the direction is changing.

a) (A) and (D) are correct
b) (B) and (C) are correct
c) All of these
d) (A), (B) and (C) are correct

10. Which of the following is correct about uniform circular motion? **[1]**

A. The direction of motion is continuously changed.
B. The direction of motion is not changed.
C. Speed and direction both remain constant.
D. D. Speed is constant, but the direction is changing.

a) A and D
b) B and C
c) All of these
d) A and C

Section B

11. **Fill in the blanks:** **[2]**

(a) The _____ of a circle of radius r is given by $2\pi r$. **[1]**

(b) When an object moves in a circular path with uniform speed, its motion is called uniform _____ motion. **[1]**

12. Match the following Column A with Column B: **[2]**

Column A	Column B
(a) Uniform speed	(i) A graph of distance travelled against time is a curved line
(b) Non-uniform speed	(ii) A graph of distance travelled against time is a straight line
(c) Uniform circular motion	(iii) Changing direction six times to complete one path

(d) Hexagonal path	(iv) When a body moves in a circle

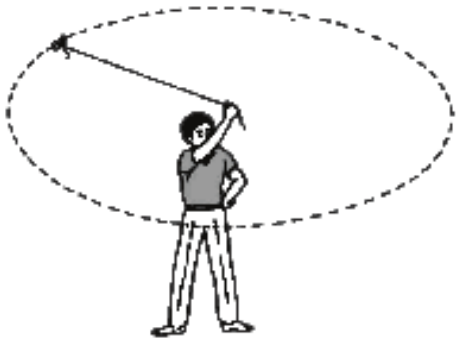
Section C

13. Write a short note on uniform circular motion. **[3]**

Section D

14. **Read the following and answer any four questions:** **[4]**

When an object moves in a circular path with uniform speed, its motion is called uniform circular motion. The direction of motion changed at every point moving along the circular path.



i. Which one of the following is most likely not a case of uniform circular motion?

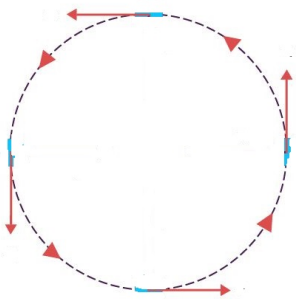
a. The motion of the earth around the sun.

b. The motion of a toy train on a circular track.

c. The motion of a racing car on a circular track.

d. The motion of hours' hand on the dial of a clock.

ii. The train is moving on a track**(below image)**. Though the speed of a train is constant the direction of motion (or direction of speed) is changing continuously. So, the train is exhibiting:



a. uniform notion

b. decelerated motion

c. uniform motion

d. accelerated motion

iii. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed.

a. 5.5 m/s

b. 5.6 m/s

c. 5.7 m/s

d. 5.8 m/s

iv. Which of the following statement is correct?

I. Motion of the moon and the earth is an example of non-uniform circular motion.

II. When the velocity of an object changes, we say that the object is accelerating.

III. A satellite in a straight orbit around the earth.

IV. The change in the velocity could be due to a change in its magnitude or the direction of the motion or both.

a. (I) and (II)

b. (II) and (III)

c. (III) and (IV)

d. (II) and (IV)

v. A sprinter is running along the circumference of a big sports stadium with constant speed. Which of the following do you think is changing in this case?

a. The magnitude of acceleration is produced.

b. Distance covered by the sprinter per second.

c. The direction in which the sprinter is running.

d. The centripetal force acting on the sprinter.

Section E

15. i. Define circular motion? **[5]**

ii. An athlete completes one round of a circular track of diameter 200 m in 40 s. If he continues to run, what will be the distance covered and the displacement at the end of 2 minutes 20 s respectively?