

Motion in a Plane

Question 1.

A body of mass 500 gram is rotating in a vertical circle of radius 1 m. What is the difference in its kinetic energies at the top and the bottom of the circle?

- (a) 4.9 J
- (b) 19.8 J
- (c) 2.8 J
- (d) 9.8 J

▼ [Answer](#)

Answer: (d) 9.8 J

Question 2.

A particle has a displacement of 2 units along the x -axis, 1 unit along the y – axis and 2 units along the z – axis. Then the resultant displacement of the particle is

- (a) 3 units
- (b) 5 units
- (c) 4 units
- (d) 1 units

▼ [Answer](#)

Answer: (a) 3 units

Question 3.

A car is moving on a circular path and takes a turn. If R^1 and R^2 are the reactions on the inner and outer wheels respectively, then

- (a) $R^1 = >R^2$
- (b) $R^1 = R^2$
- (c) $R^1 < R^2$
- (d) $R^1 > R^2$

▼ [Answer](#)

Answer: (c) $R^1 < R^2$

Question 4.

The angle between centripetal acceleration and tangential acceleration is?

- (a) 180°
- (b) 0°
- (c) 90°
- (d) 45°

▼ [Answer](#)

Answer: (c) 90°

Question 5.

Large angle produces?

- (a) high trajectory
- (b) curve trajectory

- (c) flat trajectory
- (d) straight trajectory

▼ [Answer](#)

Answer: (a) high trajectory

Question 6.

The dimensional formula for normal acceleration is

- (a) LT^{-1}
- (b) L^2T^2
- (c) L^3T^{-2}
- (d) LT^{-2}

▼ [Answer](#)

Answer: (d) LT^{-2}

Question 7.

A book is pushed with an initial horizontal velocity of 5.0 meters per second off the top of a desk. What is the initial vertical velocity of the book?

- (a) 10. m/s
- (b) 0 m/s
- (c) 50 m/s
- (d) 2.5 m/s

▼ [Answer](#)

Answer: (b) 0 m/s

Question 8.

One radian is defined to be the angle subtended where the arc length S is exactly equal to the?

- (a) radius of the circle.
- (b) diameter of the circle.
- (c) circumference of the circle.
- (d) half of radius of the circle.

▼ [Answer](#)

Answer: (a) radius of the circle.

Question 9.

A body travels along the circumference of a circle of radius 2 m with a linear velocity of 6 m/s. Then its angular velocity is

- (a) 6 rad /s
- (b) 3 rad /s
- (c) 2 rad / s
- (d) 4 rad / s

▼ [Answer](#)

Answer: (b) 3 rad /s

Question 10.

One° (1°) is equal to?

- (a) 0.1745 rad

- (b) 0.01745 rad
- (c) 0.001745 rad
- (d) 7.1745 rad

▼ [Answer](#)

Answer: (b) 0.01745 rad

Question 11.

A body makes a displacement of 4 m due East from a point O and then makes displacement of 3 m due North. Its resultant displacement from O

- (a) 7 m
- (b) 1 m
- (c) 5 m
- (d) 1 . 2 m

▼ [Answer](#)

Answer: (c) 5 m

Question 12.

A body is allowed to slide on a frictional less track from rest under-gravity. The track ends in a circular loop of diameter D. What should be the minimum height of the body in terms of D, so that it may successfully complete the loop?

- (a) D
- (b) $\frac{4}{5} D$
- (c) $\frac{5}{4} D$
- (d) 2D

▼ [Answer](#)

Answer: (c) $\frac{5}{4} D$

Question 13.

One radian is equal to?

- (a) 57.7°
- (b) 53.7°
- (c) 59.3°
- (d) 57.3°

▼ [Answer](#)

Answer: (d) 57.3°

Question 14.

A small body attached at the end of an inextensible string completes a vertical circle, then its

- (a) angular momentum remains constant
- (b) linear momentum remains constant
- (c) angular velocity remains constant
- (d) total mechanical energy remains constant

▼ [Answer](#)

Answer: (d) total mechanical energy remains constant

Question 15.

A body goes round the circumference of a circle of radius 2 m with an angular velocity of 2 rad/s.

Its centripetal acceleration is

- (a) 3 m/s^2
- (b) 1.5 m/s^2
- (c) 6 m/s^2
- (d) 12 m/s^2

▼ [Answer](#)

Answer: (d) 12 m/s^2

Question 16.

A book is pushed with an initial horizontal velocity of 5.0 meters per second off the top of a desk. What is the initial vertical velocity of the book?

- (a) $10. \text{ m/s}$
- (b) 0 m/s
- (c) 50 m/s
- (d) 2.5 m/s

▼ [Answer](#)

Answer: (b) 0 m/s

Question 17.

Which is a constant for a freely falling object?

- (a) displacement
- (b) velocity
- (c) acceleration
- (d) speed

▼ [Answer](#)

Answer: (c) acceleration

Question 18.

The tangential component and centripetal component of acceleration are?

- (a) Similar to each other
- (b) Parallel to each other.
- (c) Equal to each other.
- (d) Perpendicular to each other.

▼ [Answer](#)

Answer: (d) Perpendicular to each other.

Question 19.

A body travels along the circumference of a circle of radius 2 m with a linear velocity of 4 m/s. Its centripetal acceleration is

- (a) 8 m/s^2
- (b) 16 m/s^2
- (c) 10 m/s^2
- (d) 4 m/s^2

▼ [Answer](#)

Answer: (a) 8 m/s^2

Question 20.

A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of the particle. The motion takes place in a plane. It follows that

- (a) its acceleration is constant
- (b) its motion is circular
- (c) its velocity is constant
- (d) its motion is linear

▼ [Answer](#)

Answer: (b) its motion is circular
