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.
He dimensional formula for normal acceleration is
(a) LT^{-1}
(b) L2T2
(c) $L3T^{-2}$
(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) 4/5 D
(c) 5/4 D
(d) 2D

▼ Answer

Answer: (c) 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 gose 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/s²
(b) 1 . 5 m/s²
(c) 6 m/s²
(d) 12 m/s²

▼ Answer

Answer: (d) 12 m/s²

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. 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/s²
(b) 16 m/s²
(c) 10 m/s²
(d) 4 m/s²

▼ Answer

Answer: (a) 8 m/s²

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
