Short Answer

6.1 Angle of Rotation and Angular Velocity 37.

What is the rotational analog of linear velocity?

a. Angular displacement
b. Angular velocity
c. Angular acceleration
d. Angular momentum

38.

What is the rotational analog of distance?

a. Rotational angle
b. Torque
c. Angular velocity
d. Angular momentum

39.

What is the equation that relates the linear speed of a point on a rotating object with the object's angular quantities?

a. v = \frac{\omega}{r}
b. v = r\omega
c. v = \frac{\alpha}{r}
d. v = r\alpha

40.

As the angular velocity of an object increases, what happens to the linear velocity of a point on that object?

a. It increases, because linear velocity is directly proportional to angular velocity.
b. It increases, because linear velocity is inversely proportional to angular velocity.
c. It decreases because linear velocity is directly proportional to angular velocity.
d. It decreases because linear velocity is inversely proportional to angular velocity.

41.

What is angular speed in terms of tangential speed and the radius?

a. \omega = \frac{v^2}{r}
b. \omega = \frac{v}{r}
c. \omega = rv
d. \omega = r{v^2}

42.

Why are radians dimensionless?

a. Radians are dimensionless, because they are defined as a ratio of distances. They are defined as the ratio of the arc length to the radius of the circle.
b. Radians are dimensionless because they are defined as a ratio of distances. They are defined as the ratio of the area to the radius of the circle.
c. Radians are dimensionless because they are defined as multiplication of distance. They are defined as the multiplication of the arc length to the radius of the circle.
d. Radians are dimensionless because they are defined as multiplication of distance. They are defined as the multiplication of the area to the radius of the circle.

6.2 Uniform Circular Motion 43.

What type of quantity is centripetal acceleration?

a. Scalar quantity; centripetal acceleration has magnitude only but no direction
b. Scalar quantity; centripetal acceleration has magnitude as well as direction
c. Vector quantity; centripetal acceleration has magnitude only but no direction
d. Vector quantity; centripetal acceleration has magnitude as well as direction

44.

What are the standard units for centripetal acceleration?

a. m/s
b. \text{m/s}^2\!
c. \text{m}^2\text{/s}
d. \text{m}^2\!\text{/s}^2\!

45.

What is the angle formed between the vectors of tangential velocity and centripetal force?

a. 0^\circ
b. 30^\circ\!
c. 90^\circ
d. 180^\circ

46.

What is the angle formed between the vectors of centripetal acceleration and centripetal force?

a. 0^\circ
b. 30^\circ

c. 90^\circ
d. 180^\circ

47.

What are the standard units for centripetal force?

a. m
b. m/s
c. m/s^2
d. newtons

48.

As the mass of an object in uniform circular motion increases, what happens to the centripetal force required to keep it moving at the same speed?

a. It increases, because the centripetal force is directly proportional to the mass of the rotating body.
b. It increases, because the centripetal force is inversely proportional to the mass of the rotating body.
c. It decreases, because the centripetal force is directly proportional to the mass of the rotating body.
d. It decreases, because the centripetal force is inversely proportional to the mass of the rotating body.

6.3 Rotational Motion

49.

The relationships between which variables are described by the kinematics of rotational motion?

a. The kinematics of rotational motion describes the relationships between rotation angle, angular velocity, and angular acceleration.
b. The kinematics of rotational motion describes the relationships between rotation angle, angular velocity, angular acceleration, and angular momentum.
c. The kinematics of rotational motion describes the relationships between rotation angle, angular velocity, angular acceleration, and time.
d. The kinematics of rotational motion describes the relationships between rotation angle, angular velocity, angular acceleration, torque, and time.

50.

What is the kinematics relationship between \omega, \alpha, and t?

a. \omega = \alpha t
b. \omega = {\omega _0} - \alpha t
c. \omega = {\omega _0} + \alpha t
d. \omega = {\omega _0} + \frac{1}{2}\alpha t

51.

What kind of quantity is torque?

a. Scalar
b. Vector
c. Dimensionless
d. Fundamental quantity

52.

If a linear force is applied to a lever arm farther away from the pivot point, what happens to the resultant torque?

a. It decreases.
b. It increases.
c. It remains the same.
d. It changes the direction.

53.

How can the same force applied to a lever produce different torques?

a. By applying the force at different points of the lever arm along the length of the lever or by changing the angle between the lever arm and the applied force.
b. By applying the force at the same point of the lever arm along the length of the lever or by changing the angle between the lever arm and the applied force.
c. By applying the force at different points of the lever arm along the length of the lever or by maintaining the same angle between the lever arm and the applied force.
d. By applying the force at the same point of the lever arm along the length of the lever or by maintaining the same angle between the lever arm and the applied force.