10 Lecture - PHY101

Important Mcqs

A disk of radius 0.5 m is rotating with a constant angular velocity of 10 rad/s. What is the linear speed of a point on the circumference of the disk?

A) 5 m/s

B) 10 m/s

C) 15 m/s

D) 20 m/s

Answer: C) 15 m/s

A solid sphere is rolling down an incline without slipping. What is the ratio of the translational kinetic energy to the rotational kinetic energy?

A) 1:1

B) 3:2

C) 2:3

D) 5:7

Answer: C) 2:3

A 1 kg mass is attached to a rod of length 0.5 m and is rotated in a horizontal plane about one end of the rod. If the angular velocity of the mass is 4 rad/s, what is the centripetal force acting on the mass?

A) 4 N

B) 8 N

C) 12 N

D) 16 N

Answer: B) 8 N

A point on the rim of a wheel of radius 0.4 m moves through an angle of 60 degrees. What is the distance travelled by the point?

A) 0.14 m

B) 0.24 m

C) 0.40 m

D) 0.80 m

Answer: B) 0.24 m

A solid cylinder of mass 2 kg and radius 0.5 m is rolling without slipping with a linear velocity of 10 m/s. What is the angular velocity of the cylinder?

A) 4 rad/s

B) 8 rad/s

C) 10 rad/s

D) 20 rad/s

Answer: A) 4 rad/s

A torque of 10 Nm is applied to a wheel of moment of inertia 4 kg m^2. What is the angular acceleration of the wheel?

A) 2.5 rad/s^2

B) 4 rad/s^2

C) 6 rad/s^2

D) 8 rad/s^2

Answer: B) 4 rad/s^2

A uniform rod of length 2 m and mass 1 kg is pivoted at one end and allowed to fall under gravity. What is the angular acceleration of the rod when it makes an angle of 45 degrees with the vertical?

A) 1.5 rad/s^2

B) 2.5 rad/s^2

C) 3.5 rad/s^2

D) 4.5 rad/s^2

Answer: B) 2.5 rad/s^2

A solid sphere of radius 0.3 m and mass 5 kg is rotating about its diameter with an angular velocity of 6 rad/s. What is the kinetic energy of the sphere?

A) 54 J

B) 108 J

C) 162 J

D) 216 J

Answer: B) 108 J

A thin hoop of mass 2 kg and radius 0.5 m is rolling down an incline without slipping. What is the velocity of the hoop when it reaches the bottom of the incline?

A) 3.3 m/s

B) 6.6 m/s

C) 9.9 m/s

D) 13.2 m/s

Answer: A) 3.3 m/s

A flywheel of moment of inertia 5 kg m^2 is rotating about its axis with an angular velocity of 10 rad