

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 m². What is the angular acceleration of the wheel?

- A) 2.5 rad/s²
- B) 4 rad/s²
- C) 6 rad/s²
- D) 8 rad/s²

Answer: B) 4 rad/s²

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/s²
- B) 2.5 rad/s²
- C) 3.5 rad/s²
- D) 4.5 rad/s²

Answer: B) 2.5 rad/s²

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