## 10 Lecture - PHY101

## Important Mcqs

A disk of radius 0.5 m is rotating with a constant angular velocity of $10 \mathrm{rad} / \mathrm{s}$. What is the linear speed of a point on the circumference of the disk?
A) $5 \mathrm{~m} / \mathrm{s}$
B) $10 \mathrm{~m} / \mathrm{s}$
C) $15 \mathrm{~m} / \mathrm{s}$
D) $20 \mathrm{~m} / \mathrm{s}$

Answer: C) $15 \mathrm{~m} / \mathrm{s}$

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 $4 \mathrm{rad} / \mathrm{s}$, 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 $10 \mathrm{~m} / \mathrm{s}$. What is the angular velocity of the cylinder?
A) $4 \mathrm{rad} / \mathrm{s}$
B) $8 \mathrm{rad} / \mathrm{s}$
C) $10 \mathrm{rad} / \mathrm{s}$
D) $20 \mathrm{rad} / \mathrm{s}$

Answer: A) $4 \mathrm{rad} / \mathrm{s}$

A torque of 10 Nm is applied to a wheel of moment of inertia $4 \mathrm{~kg} \mathrm{~m}^{\wedge} 2$. What is the angular acceleration of the wheel?
A) $2.5 \mathrm{rad} / \mathrm{s}^{\wedge} 2$
B) $4 \mathrm{rad} / \mathrm{s}^{\wedge} 2$
C) $6 \mathrm{rad} / \mathrm{s}^{\wedge} 2$
D) $8 \mathrm{rad} / \mathrm{s}^{\wedge} 2$

Answer: B) $4 \mathrm{rad} / \mathrm{s}^{\wedge} 2$

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) $1.5 \mathrm{rad} / \mathrm{s}^{\wedge} 2$
B) $2.5 \mathrm{rad} / \mathrm{s}^{\wedge} 2$
C) $3.5 \mathrm{rad} / \mathrm{s}^{\wedge} 2$
D) $4.5 \mathrm{rad} / \mathrm{s}^{\wedge} 2$

Answer: B) $2.5 \mathrm{rad} / \mathrm{s}^{\wedge} 2$

A solid sphere of radius 0.3 m and mass 5 kg is rotating about its diameter with an angular velocity of 6 $\mathrm{rad} / \mathrm{s}$. 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) $3.3 \mathrm{~m} / \mathrm{s}$
B) $6.6 \mathrm{~m} / \mathrm{s}$
C) $9.9 \mathrm{~m} / \mathrm{s}$
D) $13.2 \mathrm{~m} / \mathrm{s}$

Answer: A) $3.3 \mathrm{~m} / \mathrm{s}$

A flywheel of moment of inertia $5 \mathrm{~kg} \mathrm{~m}^{\wedge} 2$ is rotating about its axis with an angular velocity of 10 rad

