1. One radian is about:
    (a) 25°   (b) 37°
    (c) 45°   **(d) 57°**

2. Wheel turns with constant angular speed then:
    (a) each point on its rim moves with constant velocity
    (b) each point on its rim moves with constant acceleration
    (c) the wheel turns through equal angles in equal times
    (d) the angle through which the wheel turns in each second increases as time goes on

3. The rotational inertia of a wheel about its axle does not depend upon its:
    (a) diameter   (b) mass
    (c) distribution of mass   **(d) speed of rotation**

4. A force with at given magnitude is to be applied to a wheel. The torque can be maximized by:
    (a) applying the force near the axle, radially outward from the axle.
    (b) applying the force near the rim, radially outward.
    (c) applying the force near the axle, parallel to a tangent to the wheel.
    (d) applying the force at the rim, tangent to the rim.

5. An object rotating about a fixed axis, I is its rotational inertia and α is its angular acceleration. Its:
    (a) is the definition of torque.   (b) is the definition of rotational inertia.
    (c) is definition of angular acceleration. **(d) follows directly from Newton's second law.**

6. The angular momentum vector of Earth about its rotation axis, due to its daily rotation is, directed:
    (a) tangent to the equator towards east   (b) tangent to the equator towards the west
    (c) north   (d) towards the sun

7. A stone of 2 kg is tied to a 0.50 m long string and swung around a circle at constant angular velocity of 12 rad/s. The net torque on the stone about the center of the circle is:
    (a) 0 N.m   (b) 6 N.m
    (c) 12 N.m   (d) 72 N.m

8. A man, with his arms at his sides, is spinning on a light frictionless turntable. When he extends his arms:
    (a) his angular velocity increases   (b) his angular velocity remains same
    (c) his rotational inertia decreases   (d) his angular momentum remains the same

9. A space station revolves around the earth as a satellite, 100 km above the Earth's surface. What is the net force on an astronaut at rest inside the space station?
    (a) equal to her weight on earth   (b) a little less than her weight on earth
    (c) less than half her weight on earth   **(d) zero (she is weightless)**

10. If the external torque acting on a body is zero, then its:
    (a) angular momentum is zero   **(b) angular momentum is conserved**
    (c) angular acceleration is maximum   (d) rotational notion is maximum

1. An angle subtended at its centre by an arc whose length is equal to its radius is:
   (a) 37.3° (b) 47.3°
   (c) 57.3° (d) 67.3°

2. The platter of the hard drive of a computer' rotates at 7300 rpm. What is the angular velocity of the platter?
   (a) 764.5 rad s^{-1} (b) 647.5 rad s^{-1}
   (c) 7300 rad s^{-1} (d) 121.6 rad s^{-1}

3. A body moving along a circular path with an increasing speed possesses.
   (a) Tangential acceleration only
   (b) Both tangential and centripetal acceleration
   (c) zero acceleration
   (d) Centripetal acceleration only

4. Centripetal force is also called:
   (a) Centrifugal force (b) Centre-seeking force
   (c) Tangential force (d) None of these

5. If r is the radius of the circular path of a particle, its linear acceleration and angular acceleration are related by:
   (a) $\vec{a} = \vec{\alpha} \times \vec{r}$ (a) $\vec{a} = \vec{r} \times \vec{\alpha}$
   (a) $\vec{\alpha} = \vec{a} \times \vec{r}$ (a) $\vec{\alpha} + \overrightarrow{a\,r}$

6. When a body moves with a constant speed in a circle:
   (a) its velocity is changing (b) its acceleration is zero
   (c) its acceleration is increasing (d) its velocity is uniform

7. The angle between centripetal acceleration and tangential acceleration is:
   (a) 0° (b) 90°
   (c) 180° (d) 45°

8. A wheel is revolving at a steady rate of 120 rev / min. Its angular velocity is
   (a) 2 π rad / s (b) 4 π rad /s
   (c) 6 π rad / s (d) 8 π rad / s

9. Which equation represents the period of circular motion?
   (a) $T = \dfrac{\pi}{\omega}$ (b) $T = \dfrac{2\pi}{\omega}$

   (c) $T = \dfrac{\pi}{\omega^2}$ (d) $T = \dfrac{2\pi}{\omega^2}$

10. $\frac{\pi}{2}$ radian = ...
    (a) 90° (b) 180°
    (c) 360° (d) 60°

11 The rotational inertia of a rigid body is referred to as its
    (a) Moment of energy (b) Moment of force
    (c) Moment of inertia (d) Moment of acceleration

12 Average angular velocity of a body rotating at angle of 30° for 5 seconds will be
    (a) 6 deg s⁻¹ (a) 7 deg s⁻¹
    (a) 8 deg s⁻¹ (a) 10 deg s⁻¹

13. A car of weight 490 N is moving with a speed of 20 m/s in a circle of radius 20 m. The centripetal force on the car is
    (a) 100 N (b) 200 N
    (c) 1000 N (d) 2000 N

14. What centripetal acceleration is required to follow a circular path with a radius of 50 m at a speed
    of 20 m/s?
    (a) 2 m/s² (b) 4 m/s²
    (c) 6 m/s² (d) 8 m/s²

15 What is the relationship between heavy objects and inertia?
    (a) Heavy objects have more inertia (b) Heavy objects have less inertia
    (c) Heavy objects have no inertia (d) all of these

16 The unit of moment of inertia of an area,
    (a) kg/m (b) kg/m²
    (c) m⁴ (d) m³

17 The moment of inertia of a thin spherical shell is
    (a) Mr⁴/2 (b) Mr²
    (c) 2/3 Mr² (d) 2/5 Mr²

18. When a body moves round a fixed axis, it has
    (a) A rotary motion (b) A circular motion
    (c) A translatory (d) A rotary motion and translatory motion

19 A solid spere has a mass of 10kg and a radius 1m. Find its moment of inertia.
    (a) 4 kg m² (b) 10 kg m²
    (c) 1 kg m² (d) 0.1 kg m²

20. The unit of the angular momentum are
    (a) Newton-sec (a) Joule-sec (a) Newton-meter (a) Joule-meter