Expected Questions from Circular Motion Discussion

1. Circular motion is
   a. Periodic and SHM
   b. Periodic but not SHM
   c. Only SHM
   d. Not periodic motion
2. Centrifugal force in rotational motion acts as
   a. Centripetal force
   b. Gravitational force
   c. Apparent force on rotating frame
   d. Viscous force
3. A body of mass 'm' is suspended from a string of length *l*. Minimum horizontal velocity that should be given to the body in its lowest position so that it may complete full revolution in vertical plane with the point of suspension as the center of circle is
   a. $\sqrt{2lg}$
   b. $\sqrt{3lg}$
   c. $\sqrt{4lg}$
   d. $\sqrt{5lg}$
4. Dr. V.K. Singh sir was sitting in a car. The car took a circular turn and his body is pressed against the side of the car. The force acting on him is
   a. Gravitational force
   b. Centrifugal force
   c. Centripetal force
   d. Electrostatic force
5. When a body moves with a constant speed along a circle:
   a. No acceleration
   b. No force acts on the body
   c. Velocity remains constant
   d. Work done is zero
6. "in a death well", a motorcyclist performs his race on circular path of radius (r) then minimum velocity at lowest point is;
   a. $\sqrt{rg}$
   b. $\sqrt{5rg}$
   c. $\sqrt{7rg}$
   d. $\sqrt{2rg}$
7. A body, attached to a string, must possess a minimum velocity at the top of vertical circle while moving round without a slack in the string. Minimum velocity will be
   a. Gr
   b. 4gr
   c. $(gr)^{1/2}$
   d. $(4gr)^{1/2}$
8. A body mass m is moving in a vertical circle with constant speed v. The tension on the mass at the bottom of the circle is
   a. $mg-mrw^2$
   b. $mg+mrw^2$
   c. $mg \times mrw^2$
   d. mg/mrw^2
9. A stone is tied at one end of a long string and whirled in a vertical circle. The tension in the string will be maximum at
   a. The high point of the circle
   b. The lowest point of the circle
   c. An angle 45°
   d. Remain unchanged throughout the motion
10. Which of the following is true for a person moving in circle with uniform motion
    a. The body had varying acceleration
    b. The body has constant speed
    c. All of above
    d. None of the above
11. A particle is moving in a vertical circle. What is the direction of angular velocity?
    a. Perpendicular to plane of motion
    b. Parallel to momentum vector
    c. Towards the radius
    d. Away from radius
12. Which of the following may be constant in a circular motion?
    a. Acceleration
    b. Velocity
    c. Magnitude of acceleration
    d. Angular displacement

13. For a car moving in a curved path. What is the contribution of banking of road?
    a. It provide necessary centripetal force
    b. It gives inward horizontal component
    c. It helps to increase friction between tyre and road
    d. It increases centrifugal force on car

14. A person f is rotating on a circular path, when the string breaks, it flies:
    a. Radially inward
    b. Radically outward
    c. Tangentially outward along the axis
    d. Along the radius

15. A man is moving with uniform velocity in circular path then, centripetal acceleration is:
    a. Zero
    b. Directed towards radius
    c. Along tangent
    d. Along the axis perpendicular to plane

16. When a stone is whirled in uniform circular motion with the help of a rope. When the rope is set free, then the stone will move
    a. Radically outward
    b. Radically inward
    c. Tangentially outward
    d. In circular motion

17. If a car of mass 5kg is moving in with velocity of 4m/s inside a hollow cylinder of radius 20cm, the force on it at highest point is
    a. 50N
    b. 100N
    c. 350N
    d. 400N

18. A pilot is flying in loop of circle with uniform velocity of 10m/s. The apparent weight of aircraft at bottom of circle is two times as that of top. The radius of loop is:
    a. 20m
    b. 10m
    c. $\frac{20}{3}m$
    d. $\frac{10}{3}m$

19. A ball is moving in a circular path of radius 5m. if tangential acceleration at any instant is 10m/s2 and the net acceleration makes an angle of 30° with the centripetal acceleration, then the instantaneous speed is
    a. $6.6ms^{-1}$
    b. $4.4ms^{-1}$
    c. $9.3ms^{-1}$
    d. $50\sqrt{3}ms^{-1}$

20. A coin is placed on a revolving disc which revolves at 60rpm at distance of 10cm from center of disc. If the coin does not slip from the disc, then coefficient of friction between coin & disc is ($g=10ms^{-2}$)
    a. 0.2
    b. 0.4
    c. 0.6
    d. 0.7

1b
2c
3d
4b
5d
6b
7c
8b
9b
10c
11a
12c
13d
14c
15b
16c
17c
18d
19c
20b

17)

$T + mg = \frac{mv^2}{r}$

$T = m\left(g - \frac{v^2}{r}\right)$

$= 350\ N$