



Dnyansagar Coaching Classes, A'nagar

Std. - XII

Sub- Physics-I

MHT-CET

(Circular Motion)

Time - 45 min.

Max Marks - 50

- 1) **The uniform circular motion is accelerated motion, because**
- the motion accelerates due to the change in velocity
 - the motion accelerates due to the change in angular velocity
 - the motion accelerates due to the force
 - all of these
- 2) **The angle between radius vector and centripetal acceleration is :**
- $\frac{\pi}{2}$ rad
 - $\frac{3\pi}{2}$ rad
 - 2π rad
 - π rad
- 3) **The angular displacement in circular motion is**
- dimensional quantity
 - dimensionless quantity
 - unitless quantity and dimensionless quantity
 - unitless quantity
- 4) **The rate of change of angular velocity w.r. to t in uniform circular motion is a**
- radial acceleration
 - angular acceleration ($\vec{\alpha}$)
 - angular speed
 - angular displacement
- 5) **A satellite of earth is revolving with uniform speed v. If gravitational force suddenly disappears, the satellite will :**
- Continue to move with velocity v along the original orbit
 - Moves with velocity v tangential to orbit
 - Fall down with increasing velocity
 - Ultimately come to rest somewhere the original orbit
- 6) **What determines the nature of the path followed by the particle?**
- Speed
 - Velocity
 - Acceleration
 - None of the above
- 7) **The relation between linear velocity and angular velocity of a body moving in circle in vector form is**
- $\vec{v} = \vec{\omega} \times \vec{r}$
 - $\vec{v} = \vec{r} \times \vec{\omega}$
 - $\vec{v} = \vec{\omega} / \vec{r}$
 - $\vec{r} = \vec{v} \times \vec{\omega}$
- 8) **Which of the following remains constant in UCM?**
- Speed
 - Kinetic energy
 - Angular momentum
 - All of these
- 9) **If a stone is tied to a string and whirled in a circle, then the centripetal force would provide**
- tension in the string
 - mass of the string
 - weight of string
 - mass of stone

- 10) **Centrifugal force is pseudo force because**
- it is not provided by any real force but it arises due to accelerated frame of reference
 - origin can not imaginary
 - its direction is outwards along radius
 - its magnitude is equal to centripetal force
- 11) **A scooter is going around a circular track with a speed of 20 ms^{-1} . The radius of the circular track is 50m. The angular velocity of the scooter is :**
- 0.4 rad s^{-1}
 - 2.5 rad s^{-1}
 - 8 rad s^{-1}
 - 1000 rad s^{-1}
- 12) **One radian is approximately equal to :**
- 180°
 - 57°
 - 90°
 - 360°
- 13) **When a cyclist takes a circular turn he leans:**
- inward
 - backward
 - outward
 - forward.
- 14) **A stone of mass m tied to a string is rotated in a circle of radius r with angular velocity ω . The force of tension trying to break the string is :**
- $mr\omega^2$
 - $\frac{m\omega^2}{r}$
 - $\frac{m\omega}{r^2}$
 - None of these.
- 15) **The angular acceleration of a particle moving along a circular path with uniform speed is :**
- uniform but non zero
 - zero
 - variable
 - such as cannot be predicted from the given information
- 16) **A particle is moving along a circular path with uniform speed. What is the angle between its instantaneous velocity and acceleration?**
- 0°
 - 45°
 - 90°
 - 180°
- 17) **A motor cyclist rides around the wall with a round vertical wall and does not fall down while riding because :**
- The force of gravity disappears
 - The frictional force of the wall balances his weight
 - He loses weight some how
 - The force exerted by the surrounding is equal to frictional force
- 18) **A car is moving along the horizontal banked curved road. At banked curve road, the normal reaction is**
- equal to weight
 - greater than weight
 - less than weight
 - less than or equal to weight
- 19) **A body moving in a circular path with constant speed has :**
- constant retardation
 - variable acceleration
 - radially outward acceleration
 - constant acceleration
- 20) **An important consequence of centrifugal force is that the earth is :**
- Spheroid
 - Sphere
 - Oblate spheroid
 - Circular
- 21) **The length of the second hand of a watch is 10mm. What is the change in the angular speed of the watch after 15 seconds?**

- a) Zero
 b) $(10\pi/2)$ mm s⁻¹
 c) $(20/\pi)$ mm s⁻¹
 d) $10\sqrt{2}$ mm s⁻¹
- 22) **The angular velocity of a wheel is 70 rad/s/ If the radius of the wheel is 0.5m, then its linear velocity will be :**
 a) 10 m/s c) 20 m/s
 b) 35 m/s d) 70 m/s
- 23) **A body is tied to a string and is whirled in the vertical circle of radius r . The velocity of the body is maximum :**
 a) at the highest point
 b) at the lowest point
 c) at a point in level with the centre horizontally
 d) None of the above.
- 24) **A particle moves in a circle of radius 25 cm at two revolutions per second, the acceleration of particle in m/s² is:**
 a) π^2 c) $8\pi^2$
 b) $4\pi^2$ d) $2\pi^2$
- 25) **Kinetic energy of a body moving in vertical circle is**
 a) constant at all points on a circle
 b) different at different points on a circle
 c) zero at all the point on a circle
 d) negative at all the points
- 26) **When a particle is moved in a vertical circle**
 a) it has constant radial and tangential acceleration
 b) it has variable tangential and radial acceleration
 c) it has only constant radial acceleration
 d) it has only constant tangential acceleration
- 27) **A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of the**
particle, the motion of the particle takes place in a plane. It follows that :
 a) its velocity is constant
 b) in moves in a straight line
 c) its kinetic energy is constant
 d) its acceleration is constant
- 28) **A particle of mass 'M' is moving in a horizontal circle of radius 'R' with uniform speed 'V'. When it moves from one point to a diametrically opposite point, its :**
 a) kinetic energy changes by $MV^2/4$
 b) momentum does not change
 c) momentum changes by $2MV$
 d) kinetic energy changes by MV^2
- 29) **A particle of mass m describes a circle of radius r . The centripetal acceleration of the particle is $4/r^2$. What will be the momentum of the particle?**
 a) $4m/r$ b) $2m/r$
 c) $4m/\sqrt{r}$ d) $2m/\sqrt{r}$
- 30) **A particle of mass m is rotating by means of a string in vertical circle. The difference in tension at the lowest and highest points will be :**
 a) $6mg$ b) $4mg$
 c) $2mg$ d) zero
- 31) **The maximum speed with which a car can be safely driven along a curved road of radius 30 m and banked at 30° with horizontal:**
 a) 130 m/s c) 14.00 m/s
 b) 1.303 m/s d) 13.03 m/s
- 32) **A car is taking a turn on a level road. It may be thrown outwards because of the:**
 a) weight
 b) lack of centripetal force
 c) reaction of the ground
 d) frictional force

- 33) The direction of angular displacement $\vec{\delta\theta}$ in U.C.M. is given by
- left hand rule
 - right hand thumb rule
 - right handed screw rule
 - either 'a' or 'b'
- 34) The infinitesimal angular displacement of a particle performing uniform circular motion is a vector because
- it obeys the cumulative and associative laws of vector addition
 - it do not obeys the laws of vector addition
 - it do not obeys the laws of multiplication of vectors
 - all of these
- 35) For a body moving in circular path of radius r with uniform speed the angle of banking is given by :
- $\frac{v^2}{r \cdot g}$
 - $\tan^{-1} \frac{v^2}{r \cdot g}$
 - $\frac{v^2}{r}$
 - None of these
- 36) Which of the following statements about the centripetal and centrifugal forces is correct?
- Centripetal force balances the centrifugal force
 - Both centripetal force and centrifugal force act on the same body
 - Centripetal; force is directed opposite to the centrifugal force
 - Centripetal force is experienced by the observer at the centre of the circular path described by the body.
- 37) Earth is slightly bulge at equator so shape of earth is oblate spheroid. This is because at equator :
- Gravitational force is maximum
 - Angular velocity is maximum
 - Centrifugal force is maximum
 - Above statement is wrong
- 38) The driver of a car travelling at velocity v suddenly sees a broad wall in front of him at a distance 'a'. He should
- brake sharply
 - turn sharply
 - both 'a' and 'b'
 - none
- 39) The centripetal force is real force which provides with the real interacting force of
- mechanical
 - electrical
 - magnetic or gravitational
 - All of these
- 40) A cyclist moves round a circular road of radius 50 metres. If the coefficient of friction between the tyres and road is 0.2, the maximum velocity with which he can go round without skidding is ($g = 10 \text{ m s}^{-2}$) :
- 5 m s^{-1}
 - 10 m s^{-1}
 - 20 m s^{-1}
 - 7.5 m s^{-1}
- 41) A spirit level is placed at the edge of a turn table along its radius. The bubble will be
- at the centre of the container
 - at the outer edge of the container
 - at the inner edge of the container
 - will oscillate about the centre of the container

- 42) A particle covers equal distances around a circular path in equal intervals of time. It has uniform non zero rate of change of :
- linear displacement
 - angular displacement
 - linear velocity
 - angular velocity
- 43) A particle is moving around a circular path with uniform angular speed ω . The radius of the circular path is r . The acceleration of the particle is :
- ω^2/r
 - ω^2/r
 - $r\omega^2$
 - $r^2\omega$
- 44) A particle is moving on a circular path with constant speed. Which of the following statements about the particle is true?
- It possesses radial acceleration
 - It possesses radial velocity
 - It possesses tangential acceleration
 - It does not possess tangential velocity.
- 45) A particle is moving along a circular path with uniform speed. What is the angle between its instantaneous velocity and acceleration?
- 0°
 - 45°
 - 90°
 - 180°
- 46) A car is moving on a curved bridge of radius r with velocity v . The maximum velocity with which it can move round it without leaving the bridge at the highest point is :
- $v = \sqrt{gr}$
 - $v = \sqrt{5gr}$
 - $v = \sqrt{2gr}$
 - $v = gr$
- 47) A particle is revolving in a circle, clockwise in the plane of the paper. The angular acceleration is directed :
- Towards the centre in the plane of the paper
 - Radially outwards in the plane of the paper
 - Perpendicular to the plane of the paper
 - Vertically in the plane of the paper
- 48) A body of mass m tied to a string of length r is at its lowest position. What should be the minimum speed given to it so as just to complete one revolution?
- \sqrt{gr}
 - $\sqrt{3gr}$
 - $\sqrt{5gr}$
 - $\sqrt{7gr}$
- 49) A road is 10 m wide. Its radius of curvature is 50 m. The outer edge is above the lower edge by a distance of 1.5 m. This road is most suited for the velocity
- 2.5 m/s
 - 8.57 m/s
 - 6.5 m/s
 - 3.5 m/s
- 50) A body of mass 10 kg is moving in a circle of radius 1 m with an angular velocity of 2 rad/s. The centripetal force is
- 10 N
 - 40 N
 - 30 N
 - 20 N



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Std. - XII

Sub- Physics-I

(Circular Motion- Answer Sheet)

Time - 45 min.

Max Marks - 50

- | | |
|-------|-------|
| 1. A | 29. D |
| 2. D | 30. A |
| 3. B | 31. D |
| 4. B | 32. B |
| 5. B | 33. D |
| 6. B | 34. A |
| 7. A | 35. B |
| 8. D | 36. C |
| 9. A | 37. C |
| 10. A | 38. A |
| 11. A | 39. D |
| 12. B | 40. B |
| 13. A | 41. C |
| 14. A | 42. B |
| 15. C | 43. C |
| 16. C | 44. A |
| 17. B | 45. C |
| 18. B | 46. A |
| 19. B | 47. A |
| 20. C | 48. C |
| 21. A | 49. B |
| 22. B | 50. D |
| 23. B | |
| 24. B | |
| 25. B | |
| 26. B | |
| 27. C | |
| 28. C | |

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