



Uniform Circular Motion

61. Find the maximum velocity for skidding for a car moved on a circular track of radius 100 m . The coefficient of friction between the road and tyre is 0.2

(a) 0.14 m/s (b) 140 m/s
(c) 1.4 km/s (d) 14 m/s

62. A car when passes through a convex bridge exerts a force on it which is equal to

(a) $Mg + \frac{Mv^2}{r}$
(b) $\frac{Mv^2}{r}$
(c) Mg
(d) None of these

63. The angular speed of seconds needle in a mechanical watch is

(a) $\frac{\pi}{30}\text{ rad/s}$ (b) $2\pi\text{ rad/s}$
(c) $\pi\text{ rad/s}$ (d) $\frac{60}{\pi}\text{ rad/s}$

64. The angular velocity of a particle rotating in a circular orbit 100 times per minute is

(a) 1.66 rad/s (b) 10.47 rad/s
(c) 10.47 deg/s (d) 60 deg/s

65. A body of mass 100 g is rotating in a circular path of radius r with constant velocity. The work done in one complete revolution is

(a) 100 rJ (b) $(r/100)\text{J}$
(c) $(100/r)\text{J}$ (d) Zero

66. A particle comes round a circle of radius 1 m once. The time taken by it is 10 sec . The average velocity of motion is

(a) $0.2\pi\text{ m/s}$ (b) $2\pi\text{ m/s}$
(c) 2 m/s (d) Zero

67. An unbanked curve has a radius of 60 m . The maximum speed at which a car can make a turn if the coefficient of static friction is 0.75 , is

(a) 2.1 m/s (b) 14 m/s
(c) 21 m/s (d) 7 m/s

68. A wheel completes 2000 revolutions to cover the 9.5 km distance. then the diameter of the wheel is

(a) 1.5 m (b) 1.5 cm
(c) 7.5 cm (d) 7.5 m



69. A cycle wheel of radius 0.4 m completes one revolution in one second then the acceleration of a point on the cycle wheel will be
 (a) 0.8 m/s^2 (b) 0.4 m/s^2
 (c) $1.6\pi^2\text{ m/s}^2$ (d) $0.4\pi^2\text{ m/s}^2$
70. The centripetal acceleration is given by
 (a) v^2/r (b) vr
 (c) vr^2 (d) v/r
71. A cylindrical vessel partially filled with water is rotated about its vertical central axis. Its surface will
 (a) Rise equally
 (b) Rise from the sides
 (c) Rise from the middle
 (d) Lowered equally
72. If a particle covers half the circle of radius R with constant speed then
 (a) Momentum change is mvr
 (b) Change in $K.E.$ is $1/2\text{ }mv^2$
 (c) Change in $K.E.$ is mv^2
 (d) Change in $K.E.$ is zero
73. An aeroplane is flying with a uniform speed of 100 m/s along a circular path of radius 100 m . the angular speed of the aeroplane will be
 (a) 1 rad/sec (b) 2 rad/sec
 (c) 3 rad/sec (d) 4 rad/sec
74. A body moves with constant angular velocity on a circle. Magnitude of angular acceleration
 (a) $r\omega^2$
 (b) Constant
 (c) Zero
 (d) None of these
75. What is the value of linear velocity, if $\vec{\omega} = 3\hat{i} - 4\hat{j} + \hat{k}$ and $\vec{r} = 5\hat{i} - 6\hat{j} + 6\hat{k}$
 (a) $6\hat{i} + 2\hat{j} - 3\hat{k}$
 (b) $-18\hat{i} - 13\hat{j} + 2\hat{k}$
 (c) $4\hat{i} - 13\hat{j} + 6\hat{k}$
 (d) $6\hat{i} - 2\hat{j} + 8\hat{k}$
76. A stone is tied to one end of a string 50 cm long is whirled in a horizontal circle with a constant speed. If the stone makes 10 revolutions in 20 s , what is the magnitude of acceleration of the stone
 (a) 493 cm/s^2 (b) 720 cm/s^2





- (c) 860 cm/s^2 (d) 990 cm/s^2

77. A 100 kg car is moving with a maximum velocity of 9 m/s across a circular track of radius 30 m . The maximum force of friction between the road and the car is

- (a) 1000 N (b) 706 N
(c) 270 N (d) 200 N

78. The maximum speed of a car on a road-turn of radius 30 m , if the coefficient of friction between the tyres and the road is 0.4 , will be

- (a) 10.84 m/sec (b) 9.84 m/sec
(c) 8.84 m/sec (d) 6.84 m/sec

79. The angular velocity of a wheel is 70 rad/sec . If the radius of the wheel is 0.5 m , then linear velocity of the wheel is

- (a) 70 m/s (b) 35 m/s
(c) 30 m/s (d) 20 m/s

80. A cyclist goes round a circular path of circumference 34.3 m in $\sqrt{22} \text{ sec}$. the angle made by him, with the vertical, will be

- (a) 45° (b) 40°
(c) 42° (d) 48°

