ARJUNA (NEET)

Motion in Plane

DPP-06

1. A car is travelling with linear velocity v on a circular road of radius r. If it is increasing its speed at the rate of 'a' m/sec^2, then the resultant acceleration will be

(A) $\sqrt{\frac{v^2}{r^2}-a^2}$ (B) $\sqrt{\frac{v^4}{r^2}+a^2}$

(C) $\sqrt{\frac{v^4}{r^2}-a^2}$ (D) $\sqrt{\frac{v^2}{r^2}+a^2}$

2. A particle P is moving in a circle of radius 'a' with a uniform speed v. C is the centre of the circle and AB is a Diameter. When passing through B the angular velocity of P about A and C are in ratio

(A) 1 : 1 (B) 1 : 2

(C) 2 : 1 (D) 4 : 1

3. A car is moving with speed 30 m/s on a circular path of radius 500 m. Its speed is increased at the rate of 2 m/sec^2. What is acceleration of the car ?

(A) 2 m/sec^2 (B) 2.7 m/sec^2

(C) 1.8 m/sec^2 (D) 9.8 m/sec^2

4. The magnitude of the tangential acceleration, the particle moving in a circle of radius of 10 cm with uniform speed completing the circle in 4 s, will be –

(A) 5π cm/s^2 (B) 2.5π cm/s^2

(C) 5π^2 cm/s^2 (D) Zero

5. A particle moves in a circle describing equal angle in equal times, its velocity vector-

(A) remains constant

(B) change in magnitude

(C) change in direction

(D) changes in magnitude and direction

6. 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) its K.E. is constant

(C) its acceleration is constant

(D) it moves in a straight line

7. Angular velocity of minute hand of a clock is :-

(A) $\frac{\pi}{30}$ rad/s (B) 8π rad/s

(C) $\frac{2\pi}{1800}$ rad/s (D) $\frac{\pi}{1800}$ rad/s

8. 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 the above

9. If a particle is rotating uniformly in a horizontal circle, then –

(A) no force is acting on particle

(B) velocity of particle is constant

(C) particle has no acceleration

(D) no work is done

10. A particle moves along a circle of radius $(20/\pi)$ m with constant tangential acceleration. If the velocity of the particle is 80 m/s at the end of the second revolution after motion has begun, the tangential acceleration is –

(A) 40 m/s^2 (B) 640 π m/s^2

(C) 160 π m/s^2 (D) 40 π m/s^2

11. The angular velocity of a wheel is 70 rad/s. 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

12. A car runs at a constant speed on a circular track of radius 100 m, taking 62.8 seconds for every circular lap. The average velocity and average speed for each circular lap respectively is :-

(A) 0, 0 (B) 0, 10 m/s

(C) 10 m/s, 10 m/s (D) 10 m/s, 0

13. A particle moves in a circle of radius 5 cm with constant speed and time period 0.2 π s. The acceleration of the particle is :-

(A) 15 m/s^2 (B) 25 m/s^2

(C) 36 m/s^2 (D) 5 m/s^2

14. A particle starts with angular acceleration 2 rad/sec^2. It moves 100 rad in a random interval of 5 sec. Find out the time at which random interval starts.

(A) 7.5 sec (B) 4.5 sec

(C) 5 sec (D) 6 sec

ANSWERS KEY

1. **(B)**
2. **(B)**
3. **(B)**
4. **(D)**
5. **(C)**
6. **(B)**
7. **(D)**
8. **(C)**
9. **(D)**
10. **(A)**
11. **(B)**
12. **(B)**
13. **(D)**
14. **(A)**

Note - If you have any query/issue

Mail us at support@physicswallah.org