

# ARJUNA (NEET)

## Motion in Plane

**DPP-05**

- Which of the following relation is correct for angular acceleration?
 

(A)  $\frac{d\omega}{dt}$  (B)  $\frac{d^2\theta}{dt^2}$   
 (C)  $\frac{\omega d\omega}{d\theta}$  (D) All of these
- If the equation for the displacement of a particle moving on a circular path is given by  $(\theta) = 2t^3 + 0.5$ , where  $\theta$  is in radians and  $t$  in seconds, then the angular velocity of the particle after 2 s from its start is :-
 

(A) 8 rad/s (B) 12 rad/s  
 (C) 24 rad/s (D) 36 rad/s
- A particle moving along a circular path. The angular velocity, linear velocity, angular acceleration and centripetal acceleration of the particle at any instant respectively are  $\vec{\omega}$ ,  $\vec{v}$ ,  $\vec{\alpha}$ ,  $\vec{a}_c$ . Which of the following relation is/are correct.
 

(a)  $\vec{\omega} \perp \vec{v}$  (b)  $\vec{\omega} \perp \vec{\alpha}$   
 (c)  $\vec{v} \perp \vec{a}_c$  (d)  $\vec{\omega} \perp \vec{a}_c$   
 (A) a, b, d (B) b, c, d  
 (C) a, b, c (D) a, c, d
- A fly wheel rotating at 600 rev/min is brought under uniform deceleration and stopped after 2 minutes, then what is angular deceleration in  $\text{rad/sec}^2$  ?
 

(A)  $\frac{\pi}{6}$   
 (B)  $10\pi$   
 (C)  $\frac{1}{12}$   
 (D) 300
- The linear and angular acceleration of a particle are  $10 \text{ m/s}^2$  and  $5 \text{ rad/s}^2$  respectively. It will be at a distance from the axis of rotation.
 

(A) 50 m (B)  $\frac{1}{2} \text{ m}$   
 (C) 1 m (D) 2 m
- 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
- A Particle covers equal distance around a circular path, in equal intervals of time. Which of the following quantities connected with the motion of the particle remains constant with time?
 

(A) Displacement (B) Velocity  
 (C) Speed (D) Acceleration
- A particle is moving along a circular path with uniform speed. Through what angle does its angular velocity change when it completes half of the circular path ?
 

(A)  $0^\circ$  (B)  $45^\circ$   
 (C)  $180^\circ$  (D)  $360^\circ$
- A particle is moving on a circular path of radius  $r$  with uniform speed  $v$ . What is the displacement of the particle after it has described an angle of  $60^\circ$  ?
 

(A)  $r\sqrt{2}$  (B)  $r\sqrt{3}$   
 (D)  $r$  (D)  $2r$

10. Velocity vector and acceleration vector in a uniform circular motion are related as  
(A) both in the same direction  
(B) perpendicular to each other  
(C) both in opposite direction  
(D) not related to each other
11. The magnitude of the displacement of a particle moving in a circle of radius  $a$  with constant angular speed  $\omega$  varies with time  $t$  as  
(A)  $2a \sin \omega t$  (B)  $2a \sin \frac{\omega t}{2}$   
(C)  $2a \cos \omega t$  (D)  $2a \cos \frac{\omega t}{2}$



**ANSWERS KEY**

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



**\*Note\*** - If you have any query/issue

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