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TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS
DPP
DAILY PRACTICE PROBLEMS
DPP NO. 1

PHYSICS: RECTILINEAR MOTION

DPP No. : 1

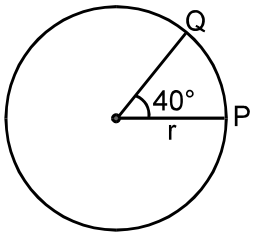
1. The acceleration of a particle is increasing linearly with time t as bt. The particle starts from the origin with an initial velocity v_0. The distance travelled by the particle in time t will be

(1) $v_0t + \frac{1}{3}bt^2$ (2) $v_0t + \frac{1}{3}bt^3$ (3) $v_0t + \frac{1}{6}bt^3$ (4) $v_0t + \frac{1}{2}bt^2$

2. A clock has a minute-hand 10 cm long. Find the average velocity between 6.00 AM to 6.30 AM for the tip of minute-hand.

(1) $\frac{22}{21}$ cm min^{-1} (2) $\frac{2}{21}$ cm min^{-1} (3) $\frac{12}{21}$ cm min^{-1} (4) $\frac{2}{3}$ cm min^{-1}

3. A particle is moving in a circle of radius r with speed v as shown in the figure. The magnitude of change in velocity in moving from P to Q is :



(1) 2 v cos 40º (2) 2 v sin 20º
(3) 2 v cos 20º (4) None of these

4. A stone is dropped from the top of a tower. When it has fallen by 5m from the top, another stone is dropped from a point 25m below the top. If both stones reach the ground at the same moment, then height of the tower from ground is : (take g = 10m/s^2)

(1) 45 m (2) 50m (3) 60m (4) 65m

5. For a particle moving in a straight line, the displacement of the particle at time t is given by

$$S = t^3 - 6t^2 + 3t + 7$$

What is the velocity of the particle when its acceleration is zero?

(1) – 9 m s^{-1} (2) – 12 m s^{-1} (3) 3 m s^{-1} (4) 42 m s^{-1}

6. A stone is thrown vertically upward with an initial speed u from the top of a tower, reaches the ground with a speed 3u. The height of the tower is:

(1) $\frac{3u^2}{g}$ (2) $\frac{4u^2}{g}$

(3) $\frac{6u^2}{g}$ (4) $\frac{9u^2}{g}$

7. A body covers first $\frac{1}{3}$ part of its journey with a velocity of 2 m/s, next $\frac{1}{3}$ part with a velocity of 3 m/s and rest of the journey with a velocity 6m/s. The average velocity of the body will be

(1) 3 m/s (2) $\frac{11}{3}$ m/s (3) $\frac{8}{3}$ m/s (4) $\frac{4}{3}$ m/s

8. A body covered a distance of L m along a curved path of a quarter circle. The ratio of distance to displacement is

(1) $\frac{\pi}{2\sqrt{2}}$ (2) $\frac{2\sqrt{2}}{\pi}$ (3) $\frac{\pi}{\sqrt{2}}$ (4) $\frac{\sqrt{2}}{\pi}$

9. A truck travelling due to North at 20 m/s turns East and travels at the same speed. The change in its velocity is

(1) $20\sqrt{2}\,m/s\,North-East$ (2) $20\sqrt{2}\,m/s\,South-East$

(3) $40\sqrt{2}\,m/s\,North-East$ (4) $20\sqrt{2}\,m/s\,North-West$

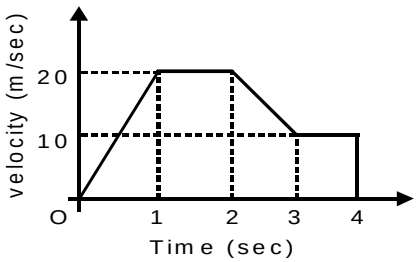
10. A car travels a distance of 2000m. If the first half distance is covered at 40 km/hour and the second half at velocity v and if the average velocity is 48 km/hour then the value of v is

(1) 56 km/hour (2) 60 km/hour (3) 50 km/hour (4) 48 km/hour

11. A particle is moving with velocity 5 m/s towards east and its velocity changes to 5 m/s north in 10 sec. Find the acceleration.

(1) $\sqrt{2}\,N-W$ (2) $\frac{1}{\sqrt{2}}N-W$ (3) $\frac{1}{\sqrt{2}}N-E$ (4) $\sqrt{2}\,N-E$

12. The variation of velocity of a particle moving along straight line is shown in figure. The distance traversed by the body in 4 seconds is



(1) 70 m (2) 60 m (3) 40 m (4) 55 m

13. A particle moves with constant acceleration for 6 seconds after starting from rest. The distance travelled during the consecutive 2 seconds interval are in the ratio

(1) 1 : 1 : 1 (2) 1 : 2 : 3 (3) 1 : 3 : 5 (4) 1 : 5 : 9

14. Two bodies of different masses m_a and m_b are dropped from two different heights, viz a and b. The ratio of times taken by the two to drop through these distance is

(1) a : b (2) $\frac{m_a}{m_b}:\frac{b}{a}$ (3) $\sqrt{a}:\sqrt{b}$ (4) $a^2:b^2$