St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 1st

Work Sheet – 19

Class – XI | Subject – Physics | Date – 07.07.20

Chapter – Circular motion | Topic – Basics of circular mmotion

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Choose the correct option for the following questions. $1 \times 15 = 15$

1. A car moves on a circular road, describing equal angles about the centre in equal interval of times. Which of the statements about its velocity is true?
   a. Velocity is constant
   b. Magnitude of velocity is constant but direction changes
   c. Both magnitude and direction change
   d. Velocity is directed towards the centre of circle
2. An insect trapped in a circular groove of radius 12cm moves along the groove steadily and completes 7 revaluations in 100sec. what is the linear speed of the motion?
   a. 2.3 cm/s
   b. 5.3 cm/s
   c. 0.44 cm/s
   d. None of these
3. A particle moves in a circle of the radius 25 cm at two revolutions per second. The acceleration of the particle in m/s^2 is –
   a. π^2
   b. $8\pi^2$
   c. $4\pi^2$
   d. $2\pi^2$
4. 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
5. The angular displacement is given as $\theta = 2t^3 + 0.5$ where θ is in radians and t is sec. the angular velocity of the particle after 2s from its starting is –
   a. 8 rad/s
   b. 12 rad/s
   c. 24 rad/s
   d. 36 rad/s
6. A body moves with constant angular velocity on a circle. Magnitude of angular acceleration is –
   a. w^2r
   b. Constant
   c. Zero
   d. None of these

7. A particle of mass m revolving in horizontal circle of radius r with uniform speed v. when partricle goes from one end to another end of diameter, then –
   a. K.E. changes by $\frac{1}{2}mv^2$
   b. K.E. changes by mv^2
   c. No change in momentum
   d. Change in momentum is 2mv
8. 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 degree/s
   d. 60 degree/s
9. Angular velocity of minute hand of clock is –
   a. $\frac{\pi}{30}\ rad/s$
   b. $8\pi\ rad/s$
   c. $\frac{2\pi}{1800}\ rad/s$
   d. $\frac{\pi}{1800}\ rad/s$
10. The angular velocity of a wheel is 70rad/s. if the radius is 0.5m, then linear speed is –
   a. 70 m/s
   b. 35m/s
   c. 30m/s
   d. 20m/s
11. A fly wheel rotating at 600 rev/min is brought under uniform deceleration and stopped after 2 min. The angular deceleration in rad/s^2 is –
   a. $\frac{\pi}{6}$
   b. 10π
   c. $\frac{1}{12}$
   d. 300
12. The ratio of the angular velocities of minute hand and hour hand of a clock is –
   a. 1:12
   b. 6:1
   c. 12:1
   d. 1:6
13. A ceiling fan is switched off while rotating with a speed of 100rpm. It stops after 15secs. How many turns has it completed within that 15sec?
   a. 12.5
   b. 40
   c. 32.6
   d. 15.6
14. If the angular speed of a wheel is 120rpm, then in rad/s unit it will be –
   a. π^2
   b. 4π
   c. 2π
   d. $4\pi^2$

15. A fan is switched on at rest (length of one blade is l). If the linear speed at the edge of a blade after rotating θ angle be v, then the angular acceleration is –
    a. $\frac{v^2}{r}$
    b. $\frac{2v^2}{r^2\theta}$
    c. $\frac{v^2}{r^2\theta}$
    d. $\frac{v^2}{2r^2\theta}$

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