

### CHAPTER: 3 KINEMATICS EXAM STYLE QUESTIONS

MCQs:

1. Which of the following is correct?
  - a.  $distance = displacement$
  - b.  $distance < displacement$
  - c.  $distance > displacement$
  - d.  $distance \geq displacement$
2. The displacement of the particle is described by the equation,  $s = (2t^3 + 3)m$ , its instantaneous acceleration at  $t = 2sec$  is,
  - a.  $12m/s^2$
  - b.  $24m/s^2$
  - c.  $19m/s^2$
  - d.  $27m/s^2$
3. The displacement of a body is directly proportional to cube of time elapsed. The magnitude of acceleration of the body is.
  - a. Increasing with time
  - b. Decreasing with time
  - c. Constant
  - d. Zero
4. A bus travels the first one-third of distance with speed of  $10km/hr$ , the next one third at  $20 km/hr$  and last at  $60km/hr$ . Its average velocity is,
  - a.  $16km/hr$
  - b.  $18km/hr$
  - c.  $48km/hr$
  - d.  $30km/hr$
5. If a bullet loses half of its velocity on penetrating 3cm in a wooden block, then how much will it penetrate more before coming to rest?
  - a.  $1cm$
  - b.  $2cm$
  - c.  $3cm$
  - d.  $4 cm$
6. The distance travelled by a car along a straight line is  $x = 12t + 3t^2 - 2t^3$  where, x is in meters and t in seconds. The velocity of the car at the start will be,
  - a.  $7m/s$
  - b.  $9m/s$
  - c.  $12m/s$
  - d.  $16m/s$
7. The displacement time graph of a moving particle is shown in the figure. The instantaneous velocity of the particle is negative at the point.
  - a. C
  - b. D
  - c. E
  - d. F
8. In the given  $v - t$  graph the distance travelled by the body in 5 seconds will be,
  - a. 20m
  - b. 40m
  - c. 80m
  - d. 100m
9. A particle covers half of its total distance with speed  $30km/hr$  and the rest half distance with speed  $20km/hr$ . Its average speed during the complete journey is,
  - a.  $25km/hr$
  - b.  $24km/hr$
  - c.  $50km/hr$
  - d.  $10km/hr$
10. A ball is thrown vertically downward with a velocity of  $20m/s$  from the top of a tower. It hits the ground after some time with a velocity of  $80m/s$ . The height of the tower is,
  - a. 300m
  - b. 320m
  - c. 340m
  - d. 360m
11. The trajectory of projectile is given by the equation  $y = \sqrt{3}x - 7.5 \times 10^{-4}x^2$ , where x and y are in meters,
  - a.  $30^\circ$
  - b.  $60^\circ$
  - c.  $75^\circ$
  - d.  $90^\circ$
12. A boy standing at the top of a tower of 20m height drops a stone. Assuming  $g = 10m/s^2$ , the velocity with which it hits the ground is
  - a.  $5m/s$
  - b.  $10m/s$
  - c.  $20m/s$
  - d.  $40m/s$
13. The displacement-time graphs of two moving particles make angles of  $30^\circ$  and  $45^\circ$  with the x-axis as shown in figure. The ratio of their respective velocity is:
  - a.  $\sqrt{3}:1$
  - b. 1:1
  - c. 1:2
  - d.  $1:\sqrt{3}$
14. The horizontal range and the maximum height of a projectile are equal. The angle of projection of the projectile is,
  - a.  $\theta = \tan^{-1}(\frac{1}{4})$
  - b.  $\theta = \tan^{-1}(4)$
  - c.  $\theta = \tan^{-1}(2)$
  - d.  $\theta = \tan^{-1}(1)$
15. A missile is fired for maximum range with an initial velocity of  $20m/s$ . The range of missile is,
  - a. 20m
  - b. 40m
  - c. 50m
  - d. 60m
16. The speed of projectile at maximum height is half of its initial speed. The angle of projectile is,
  - a.  $15^\circ$
  - b.  $30^\circ$
  - c.  $45^\circ$
  - d.  $60^\circ$
17. If a particle is projected at an angle  $45^\circ$ , then relation between range and maximum height is,
  - a.  $R = 4H$
  - b.  $4R = H$
  - c.  $2H = R$
  - d. None
18. A boat goes across a river with velocity  $12km/hr$ . The magnitude of its resultant speed in flowing water is  $13km/hr$ . The velocity of water flow in the river is,
  - a.  $1km/hr$
  - b.  $5km/hr$
  - c.  $7km/hr$
  - d.  $9km/hr$

