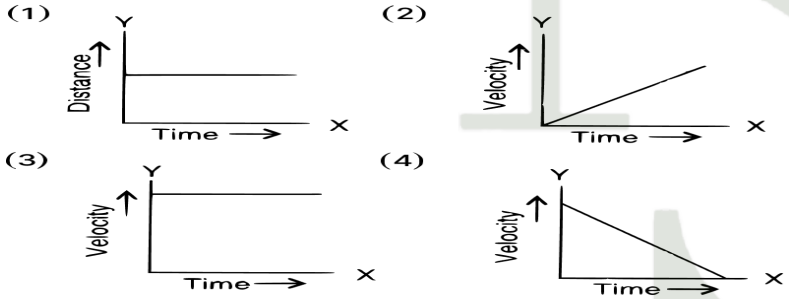
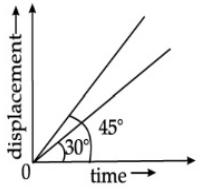
KINEMATICS MCQs

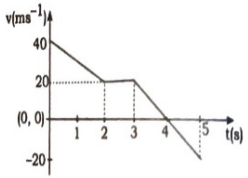
1. Which of the following is correct?
   a. $distance = displacement$ c. $distance > displacement$
   b. $distance < displacement$ d. $distance \geq displacement$
2. The displacement of the particle is described by the equation, $s = (2t^3 + 3)m$, its instantaneous acceleration at $t = 2sec$ is,
   a. $12m/s^2$ 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 c. Decreasing with time
   b. 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. A boy started his journey from home to school which is 16km far at uniform speed 2km/hr and while returning with 3km/hr. What is his average velocity?
   a. 1km/hr b. 2.4 km/hr c. 2.5 km/hr d. 0
6. Which of the following graphs shown below represents the uniform motion of an object?



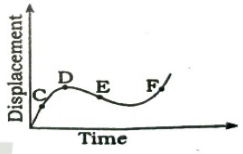
7. Time taken by train of length 150m and travelling with uniform velocity of 60km/hr to cross completely a bridge of length 1.5km will be.
   a. 9 sec b. 9.9 sec c. 90 sec d. 99 sec
8. A body thrown vertically upward and attains a velocity 15m/s at half of the maximum height. The maximum height up to the body can reach will be:
   a. 17.8m b. 22.5m c. 34.5 d. 45.5m
9. 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. $4\ cm$
10. 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. $16m/s$
11. 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. $10km/hr$
12. 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. $360m$
13. 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. $40m/s$
14. The displacement-time graphs of two moving particles make angles of 30^0 and 45^0 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. $1:\sqrt{3}$
15. In the given $v - t$ graph the distance travelled by the body in 5 seconds will be,



    a. $20m$
    b. $40m$
    c. $80m$
    d. $100m$
16. 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
17. What is the ratio of the average acceleration during the intervals OA and AB in the velocity-time graph as shown below?
    a. 1 c. ½
    b. 1/3 d. 3/1