DPP
DAILY PRACTICE PROBLEMS

CLASS : XITH   SUBJECT : PHYSICS
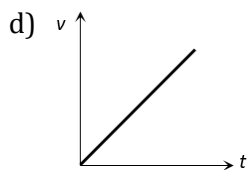DATE :   DPP NO. : 10
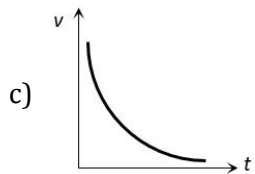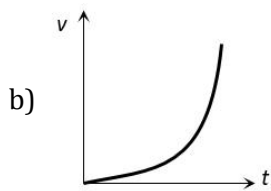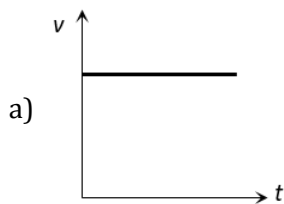
Topic :-MOTION IN A STRAIGHT LINE

1. Which of the following velocity-time graphs represent uniform motion

   a)

   b)

   c)

   d)

2. The distance-time graphs of a particle at time t makes angle 45° with the time axis. After two seconds, it makes an angle 60° with the time axis. What is the average acceleration of the particle?

   a) 1/2   b) $\sqrt{3}/2$ c) $(\sqrt{3} - 1)/2$ d) $(\sqrt{3} + 1)/2$

3. A scooterist sees a bus 1 km ahead of him moving with a velocity of 10 ms^{-1}. With what speed the scooterist should move so as to overtake the bus in 100 s?

   a) 10 ms^{-1} b) 15 ms^{-1} c) 20 ms^{-1} d) 17 ms^{-1}

4. A particle has initial velocity $(2\hat{i} + 3\hat{j})$ and acceleration $(0.3\hat{i} + 0.2\hat{j})$. The magnitude of velocity after 10 seconds will be

    a) $9\sqrt{2}$ units   b) $5\sqrt{2}$ units   c) 5 units   d) 9 units

5. A rocket is fired upwards. Its engine explodes fully is 12s. The height reached by the rocket as calculated from its velocity-time graph is
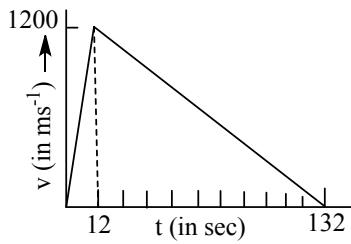
    a) 1200×60m   b) 1200×132m   c) $\frac{1200}{12}$ m   d) 1200×12^2m

6. Figure given shows the distance –time graph of the motion of a car. It follows from the graph that the car is
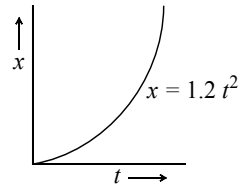
    a) At rest   b) In uniform motion
    c) In non-uniform acceleration   d) Uniformly accelerated

7. An object start sliding on a frictionless inclined plane and from same height another object start falling freely

    a) Both will reach with same speed   b) Both will reach with the same acceleration
    c) Both will reach in same time   d) None of above

8. Three persons P,Q and R of same mass travel with same speed u such that each one faces the other always. After how much time will they meet each other?
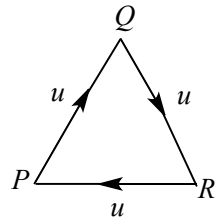
    a) d/u sec   b) $2d/3u$ sec   c) $2d/\sqrt{(3)}u$ sec   d) $d/\sqrt{3u}$ sec

9. A body is released from the top of a tower of height h. It takes $t\ sec$ to reach the ground. Where will be the ball after time $t/2$ sec
   a) At h/2 from the ground
   b) At h/4 from the ground
   c) Depends upon mass and volume of the body
   d) At $3h/4$ from the ground

10. You drive a car at seed of $70\ km/hr$ in a straight road for $8.4\ km$, and then the car runs out of petrol. You walk for $30\ min$ to reach a petrol pump at a distance of $2\ km$. The average velocity from the beginning of your drive till you reach the petrol pump is
    a) $16.8\ km/hr$ b) $35\ km/hr$ c) $64\ km/hr$ d) $18.6\ km/hr$

11. A ball P is dropped vertically and another ball Q is thrown horizontally with the same velocities from the same height and at the same time. If air resistance is neglected, then
    a) Ball P reaches the ground first
    b) Ball Q reaches the ground first
    c) Both reach the ground at the same time
    d) The respective masses of the two balls will decide the time

12. A parachutist after bailing out falls $50\ m$ without friction. When parachute opens, it decelerates at $2\ m/s^2$. He reaches the ground with a speed of $3\ m/s$. At what height, did he bail out
    a) $293\ m$ b) $111\ m$ c) $91\ m$ d) $182\ m$

13. A particle moves along a straight line OX. At a time t (in second) the distance x (in metre) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest?
    a) 24 m   b) 40 m   c) 56 m   d) 16 m

14. A man goes $10\ m$ towards North, then $20\ m$ towards east then displacement is
    a) $22.5m$ b) $25m$ c) $25.5m$ d) $30m$

15. Velocity-time curve for a body projected vertically upwards is
    a) Parabola   b) Ellipse   c) Hyperbola   d) Straight line

16. The displacement of the body along x - axis depends on time as $\sqrt{x} = t + 1$. Then the velocity of body
    a) Increases with time   b) Decreases with time   c) Independent of time   d) None of these

17. A body is thrown vertically up with a velocity u. It passes three points A,B and C in its upward journey with velocities $\frac{u}{2}, \frac{u}{3}$ and $\frac{u}{4}$ respectively. The ratio of the separations between points A and B and between B and C i.e.,$\frac{AB}{BC}$ is

a) 1   b) 2   c) $\dfrac{10}{7}$ d) $\dfrac{20}{7}$

18. A particle moving in a straight line and passes through a point O with a velocity of $6ms^{-1}$. The particle moves with a constant retardation of $2ms^{-2}$ for $4\ s$ and there after moves with a constant velocity. How long after leaving O does the particle return to O
    a) $3s$ b) $8s$ c) $6\ m$ d) $8\ m$

19. A particle moves in a straight line with a constant acceleration. It changes its velocity from 10 ms^{-1} to 20 ms^{-1} while passing through a distance $135\ m$ in t second. The value of t is
    a) 12   b) 9   c) 10   d) 1.8

20. A car starts from rest and accelerates uniformly to a speed of 180 $km\text{h}^{-1}$ in 10 $seconds$. The distance covered by the car in this time interval is
    a) $500\ m$ b) $250\ m$ c) $100\ m$ d) $200\ m$