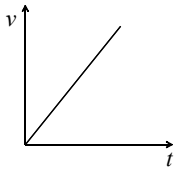
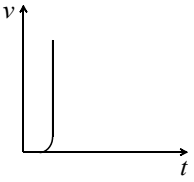
DPP
DAILY PRACTICE PROBLEMS

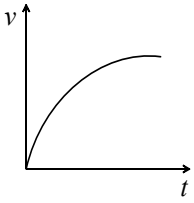
CLASS : XITH **SUBJECT : PHYSICS**
DATE : **DPP NO. : 3**

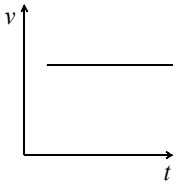
Topic :-MOTION IN A STRAIGHT LINE

1. An object is dropped from rest. Its v-t graph is

a) 

b) 

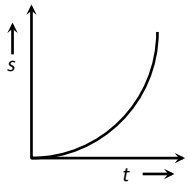
c) 

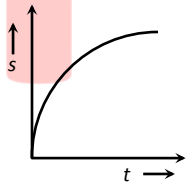
d) 

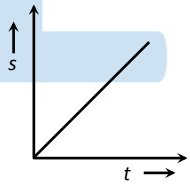
2. A particle is thrown vertically upwards. If it velocity at half of the maximum height is 10 m/sec, then maximum height attained by it is (Take $g = 10\ m/\sec^2$)

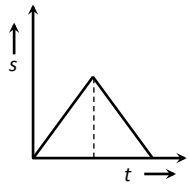
a) 8 m b) 10 m c) 12 m d) 16 m

3. Which graph represents the uniform acceleration

a) 

b) 

c) 

d) 

4. What is the relation between displacement, time and acceleration in case of a body having uniform acceleration

a) $S = ut + \frac{1}{2} ft^2$ b) $S = (u + f)\ t$ c) $S = v^2$ - $2fs$ d) None of these

5. The acceleration 'a' in m/s^2 of a particle is given by $a = 3t^2 + 2t + 2$ where t is the time. If the particle starts out with a velocity $u = 2m/s$ at $t = 0$, then the velocity at the end of 2 $seconds$ is

a) 12 m/s b) 18 m/s c) 27 m/s d) 36 m/s

6. Two bodies are thrown simultaneously from a tower with same initial velocity v_0: one vertically upwards, the other vertically downwards. The distance between the two bodies after time t is

a) $2v_0t + \frac{1}{2} gt^2$ b) $2v_0t$ c) $v_0t + \frac{1}{2} gt^2$ d) v_0t

7. An aeroplane files 400 m north and 300 m south and then files 1200 m upwards then net displacement is
   a) 1200 m b) 1300 m c) 1400 m d) 1500 m

8. The displacement of a particle undergoing rectilinear motion along the x-axis is given by $x = (2t^2 + 21t^2 + 60t + 6)$. The acceleration of the particle when its velocity is zero is
   a) 36ms^{-2} b) 9ms^{-2} c) -9ms^{-2} d) -18ms^{-2}

9. A river is flowing from W to E with a speed of 5 m/min. A man can swim in still water with a velocity 10 m/min. In which direction should the man swim so as to take the shortest possible path to go to the south
   a) 30° with downstream
   b) 60° with downstream
   c) 120° with downstream
   d) South

10. The numerical ratio of displacement to the distance covered is always
    a) Less than one b) Equal to one
    c) Equal to or less than one d) Equal to or greater than one

11. From the top of tower, a stone is thrown up. It reaches the ground in t_1 second. A second stone thrown down with the same speed reaches the ground in t_2 second. A third stone released from rest reaches the ground in t_3 second. Then
    a) $t_3 = \frac{(t_1 + t_2)}{2}$ b) $t_3 = \sqrt{t_1 t_2}$ c) $\frac{1}{t_3} = \frac{1}{t_1} - \frac{1}{t_2}$ d) $t_3^2 = t_2^2 - t_1^2$

12. One car moving on a straight road covers one third of the distance with 20 km/hr and the rest with 60 km/hr. The average speed is
    a) 40 km/hr b) 80 km/hr c) $46\frac{2}{3}$ km/hr d) 36 km/hr

13. A particle starts from rest, acceleration at 2 m/s^2 for 10 s and then goes with constant speed for 30 s and then decelerates at 4 m/s^2 till it stops. What is the distance travelled by it
    a) 750 m b) 800 m c) 700 m d) 850 m

14. Acceleration of a particle changes when
    a) Direction of velocity changes b) Magnitude of velocity changes
    c) Both of above d) Speed changes

15. A cat moves from X to Y with a uniform speed v_u and returns to X with a uniform speed v_d. The average speed for this ground trip is
    a) $-\frac{2v_d v_u}{v_d + v_u}$ b) $\sqrt{v_u v_d}$ c) $\frac{v_d v_u}{v_d + v_u}$ d) $\frac{v_u + v_d}{2}$

16. A boat takes two hours to travel 8 km and back in still water. If the velocity of water 4 kmh^{-1}, the time taken for going ups tream 8km and coming back is

a) 2h
b) 2 h 40 min
c) 1 h 20 min
d) Cannot be estimated with the information given

17. A person travels along a straight road for the first half time with a velocity v_1 and the next half time with a velocity v_2

The mean velocity V of the man is

a) $\frac{2}{V} = \frac{1}{v_1} + \frac{1}{v_2}$
b) $V = \frac{v_1 + v_2}{2}$
c) $V = \sqrt{v_1 v_2}$
d) $V = \sqrt{\frac{v_1}{v_2}}$

18. A particle is projected with velocity v_0 along x - $axis$.The deceleration on the particle is proportional to the square of the distance from the origin i.e., $a = -ax^2$.The distance at which the particle stops is

a) $\sqrt{\frac{3v_0}{2\alpha}}$
b) $\left(\frac{3v_0}{2\alpha}\right)^{\frac{1}{3}}$
c) $\sqrt{\frac{3v_0^2}{2\alpha}}$
d) $\left(\frac{3v_0^2}{2\alpha}\right)^{\frac{1}{3}}$

19. Two balls are dropped to the ground from different heights. One ball is dropped 2 s after the other but they both strike the ground at the same time. If the first ball takes 5 s to reach the ground, then the difference in initial heights is $(g = 10\ ms^{-2})$

a) 20 m
b) 80 m
c) 170 m
d) 40 m

20. A body starts from origin and moves along x-axis such that at any instant velocity is $v_t = 4t^3$ - 2 t where t is in second and v_t in ms^{-1}. The acceleration of the particle when it is 2m from the origin is

a) $28ms^{-2}$
b) $22ms^{-2}$
c) $12ms^{-2}$
d) $10ms^{-2}$