Mechanics

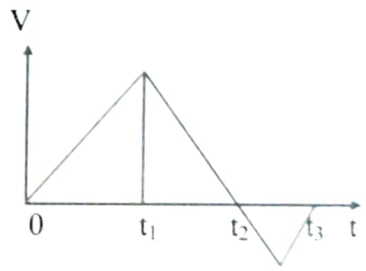
01. Linear Motion

1) An object is projected upwards with a velocity of 100 ms^{-1} from the ground. If the air resistance is neglected it will strike the ground in,
1) 5s 2) 10 s 3) 15 s 4) 20 s 5) 25 s (1992)

2) Consider the following statements made about the motion of a particle.
A. Velocity of a particle cannot be reversed without changing the direction of its acceleration.
B. When a particle is projected vertically downwards with a very large initial velocity its acceleration will exceed the acceleration due to gravity,
C. when the acceleration of a particle is zero it must necessarily be at rest.
Of the above statements,
1) Only A and B are true 2) Only B and C are true 3) Only A and C are true
4) all A, B and C are true 5) all A, B and C are false (1992)

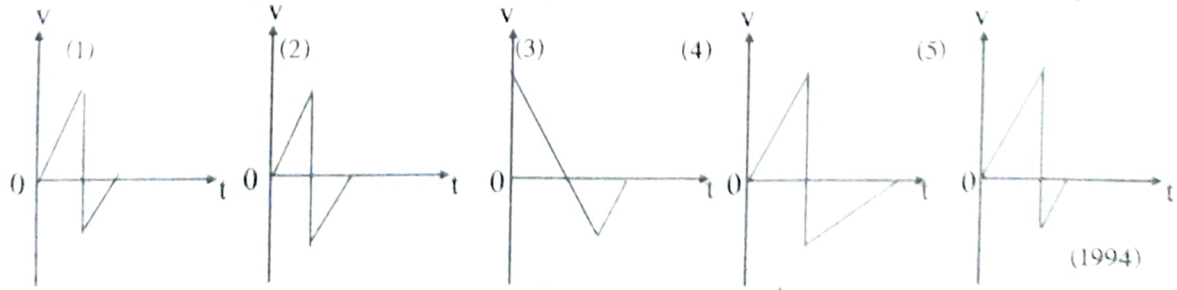
3) An object is dropped from a helicopter which is moving horizontally at a constant velocity of 45 ms^{-1} 180m above the ground. Time taken for the object to reach the ground is,
1) 3 s 2) 4 s 3) 5s 4) 6s 5) 12 s (1993)

4) The figure shows the velocity – time graph for a particle which starts from rest and moves along X direction. According to this graph.



A) the particle comes to rest only at time $t = t_3$
B) the particle returns to its original position at time $t = t_3$
C) the particle accelerates only during the time interval $0 - t_1$
Of the above statements.
1) Only (A) is true 2) Only (B) is true 3) Only (A) and (C) are true
4) Only (A) and (B) are true 5) all (A), (B) and (C) are true (1993)

5) An object dropped from a height h bounces back from the floor to a height $\frac{h}{2}$ which of the following velocity (v) time (t) graphs best represents the motion of the object?



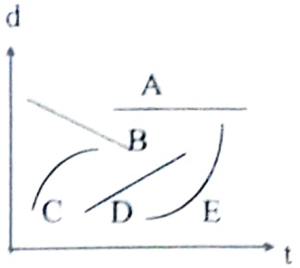
(1994)

6) A bird flying at a high of 40 m with a speed of 10ms^{-1} drops a small fruit from its mouth. If free fall is assumed the speed of the fruit just before it reaches the ground is,
1) 10 ms^{-1} 2) 15 ms^{-1} 3) $20\sqrt{2}$ ms^{-1} 4) 25 ms^{-1} 5) 30 ms^{-1} (1995)

7) Figure shows five displacement (d) time (t) curves for five different objects, the object which has an acceleration in direction of its motion is represented by

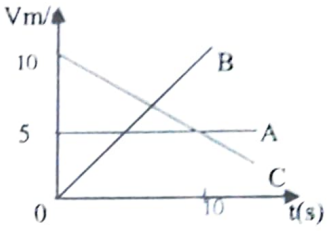
1) A 2) B 3) C 4) D 5) E

(1996)



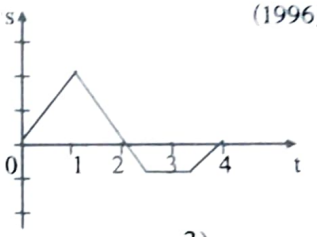
8) Figure shows velocity (V) – time (t) curves of three particles A,B and C moving along a straight line. If at t = 0 all the particles can be found together at a certain point on the straight line then at t = 10 s

1) particles A and B meet again
2) particles B and C meet again
3) particles C and A meet again
4) particles A, B and C all meet again
5) none of the particles meet again

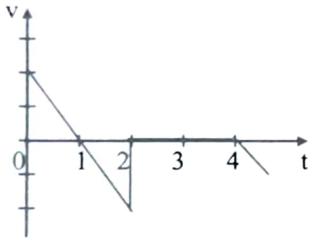


(1996)

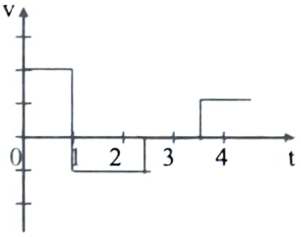
9) Which of the following curves correctly represents the corresponding velocity (V) - time (t) curve for the displacement (s) – time (t) curve show in the figure?



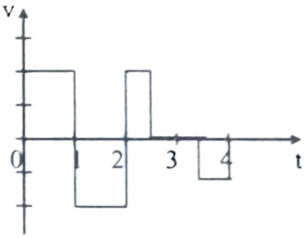
1)



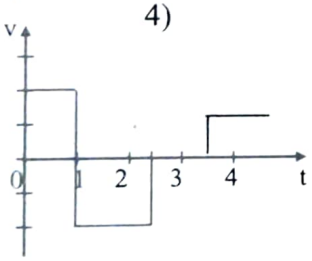
2)



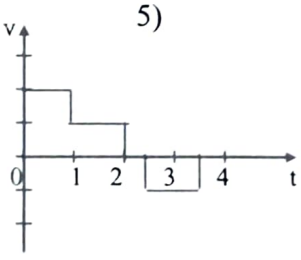
3)



4)

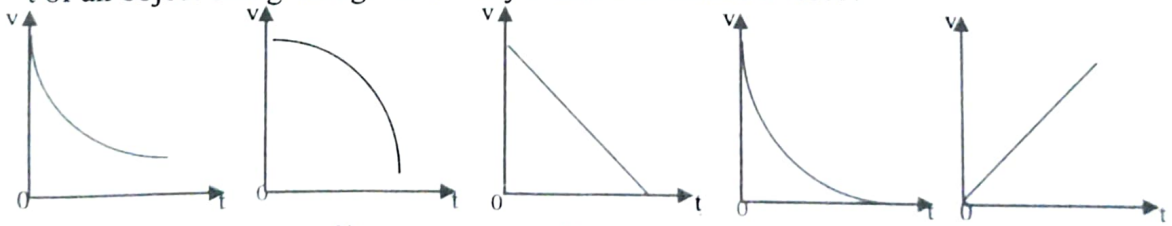


5)



(1997)

10) Which of the following graphs best represents the variation of velocity, V, with time t of an object being brought to rest by a constant resultant force?



1) 2) 3) 4) 5) (1999)

11) The distances traveled by an object falling freely form rest during first, second and third seconds are in the ratio

1) 1 : 2 : 3 2) 1 : 4 : 9 3) 1 : 2 : 9 4) 1 : 1 : 1 5) 1 : 3 : 5 (1999)