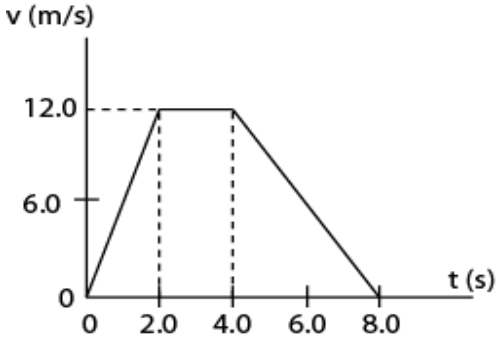
Old Exam . Questions Ch.2

T072

Q2.The position of an object is given as a function of time by $x = 4.0t^2 - 3.0t^3$, where *x* is in meters and *t* is in seconds. Its average acceleration during the interval from *t* = 1.0 s to *t* = 2.0 s is:(Ans: −19 m/s^2)

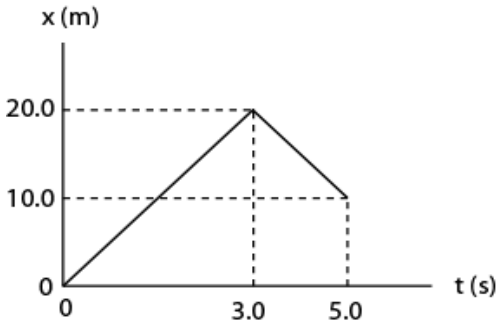
Q3.: A car starts from rest and undergoes a constant acceleration. It travels 5.0 m in the time interval from t = 0 to t = 1.0 s. Find the displacement of the car during the time interval from t = 1.0 s to t = 2.0 s.(Ans: 15 m)

Q4. Fig. 1 represents the velocity of a car (v) moving on a straight line as a function of time (t). Find the acceleration of the car at 6.0 s. (A ns: -3.0 m/s^2)

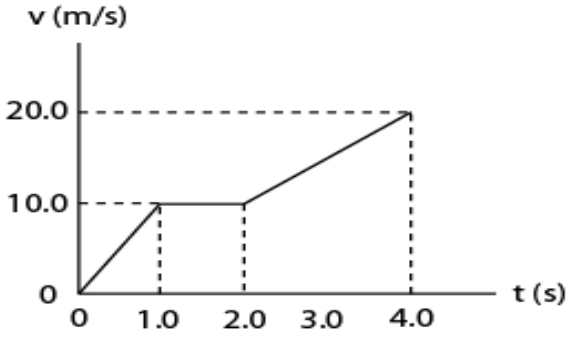


T071 :

Q3.Fig 1 shows the position-time graph of an object. What is the average velocity of the object between t=0.0 s and t= 5.0 s? (Ans: 2.0 m/s)



Q4. Fig 2 shows a velocity-time graph of a runner. If the runner starts from the origin, find his position at t = 4.0 s.(Ans: 45 m)



Q5. An object is thrown vertically upward with an initial speed of 25 m/s from the ground. What is the height of the object 1.0 s before it touches ground? (Ans:20 m)

Q6. A car starts from rest and accelerates at a rate of 2.0 m/s^2 in a straight line until it reaches a speed of 20 m/s. The car then slows down at a constant rate of 1.0 m/s^2 until it stops. How much time elapses (total time) from start to stop? (Ans: 30 s)

T062

Q3: A car travels along a straight line at a constant velocity of 18 *m/s* for 2.0 *s* and then accelerate at $-$ 6.0 m/s^2 for a period of 3.0 *s*. The average velocity of the car during the whole 5.0 *s* is: (Ans: 13 m/s)

Q4. The velocity as a function of time for a particle moving along the *x*-axis is shown in Fig.1. The motion clearly has two different parts: the first part is from $t = 0$ to t = 2.0 s, and the second part is from $t =$ 2.0 *s* to t = 6.0 *s*. Which one of the following statements is correct? (Ans: At $t = 4.0$ *s* the acceleration is -5.0 m/s^2)

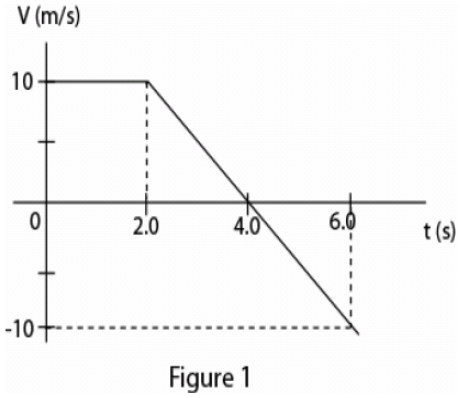


Figure 1

Q5. A particle moves along the *x* axis. Its position is given by the equation $x = 2.0 + 3.0\,t - t^3$ with *x* in meters and *t* in seconds. The average acceleration from $t = 0$ to $t = 2.0$ s is: (Ans: $-6.0\ m/s^2$)

Q6. An arrow is shot straight up with an initial speed of 98 *m/s*. If friction is neglected, how high the arrow can reach? (Ans: 490 *m)*

T061

Q2. A stone is thrown vertically downward from the top of a 40 m tall building with an initial speed of 1.0 m/s. After 2.0 s the stone will have traveled a distance of (Ans: 22 m)

Q3. A particle starts from the origin at t = 0 and moves along the positive x-axis. A graph of the velocity of the particle as a function of time is show in Fig 1. The average velocity of the particle between t = 0.0 s and 5.0 s is: (Ans: 1.4 m/s)

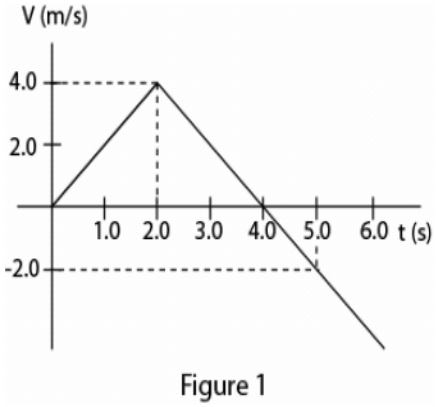


Figure 1

Q4. At a traffic light, a truck traveling at 10 m/s passes a car as it starts from rest. The truck travels at a constant velocity and the car accelerates at 4.0 m/s^2. How much time does the car take to catch up with the truck? (Ans: 5.0 s)

Q5. The coordinate of a particle in meters is given by $x(t)=2.0t-2.0t^2$, where the time t is in seconds. The particle is momentarily at rest at time t equal to: (Ans: 0.50 s)

T052

Q2. An object starts from rest at the origin and moves along the x axis with a constant acceleration of 4 m/s 2 . Its average velocity as it goes from x = 2 m to x = 18 m is**: (Ans: 8 m/s)**

Q3. Two cars are 150 km apart and traveling toward each other. One car is moving at 60. km/h and the other is moving at 40. km/h. In how many hours will they meet? **(Ans: 1.5 h)**

Q4. The coordinate of a particle in meters is given by : $x(t)= 16t -3.0\ t^3$ where the time t is in seconds. The particle is momentarily at rest at time t : **(Ans: t= 1.3 s).**

Q5. A stone and a ball are thrown vertically upward with different initial speeds: 20 m/s for the stone and 10 m/s for the ball. If the maximum height reached by the ball is H then the maximum height reached by the stone is: **(Ans: 4 H)**

T051

Q2. A helicopter at height h (m) from the surface of the sea is descending at a CONSTANT SPEED v (m/s). The time it takes to reach the surface of the sea can be found from: **(Ans: -h = -v t)**

Q3: A particle starts from rest at t = 0 s. Its acceleration as a function of time is shown in Fig. 1. What is its speed at the end of the 6.0 s? **(Ans: 4.0 m/s)**

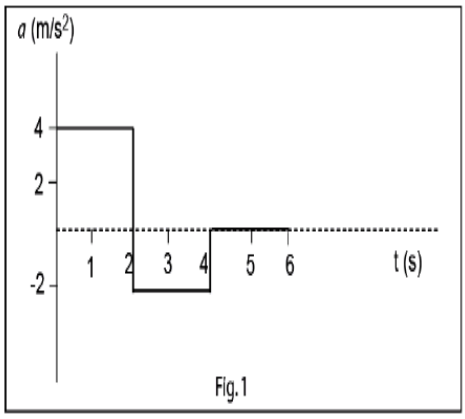


Fig.1

Q4. The position of a particle x(t) as a function of time (t) is described by the equation: x(t) = 2.0 + 3.0 t – t 3 , where x is in m and t is in s. What is the maximum positive position of the particle on the x axis? (Ans: 4.0 m).

Q5. A stone is thrown vertically downward from a building with an initial speed of 2.0 m/s. It reaches the ground after 5.0 s. What is the height of the building? (Ans: 130 m)

T042

Q3 A particle moves along the x axis from Xi to Xf . Of the following values of the initial and final coordinates, which one results in the displacement with the largest magnitude?

A1 Xi = -4 m , Xf = 4 m ; A2 Xi = -4 m , Xf = -8 m ; A3 Xi = -4 m , Xf = 2 m ; A4 Xi = 4 m , Xf = -2 m ; A5 Xi = 4 m , Xf = 6 m (Ans: Xi = -4 m , Xf = 4 m)

Q4 Each of the following four particles move along an x axis. Their coordinates as functions of time are given by:
particle 1: x(t) = 3.5 - 2.7*t**4
particle 2: x(t) = 3.5 + 2.7*t**3
particle 3: x(t) = 3.5 + 2.7*t**2 and
particle 4: x(t) = 3.5 - 3.4*t - 2.7*t**2 .
Which of these particles have constant acceleration?

Q5 Starting at time t = 0, an object moves along a straight line. Its coordinate in meters is given by x(t) = 75*t - 1.0*t**3 , where t is in s. When velocity (v) of the object = 0, the value of its acceleration is : (Ans: -30 m/s**2)

Q6 A ball is dropped from the top of a building having height H. If it hits the ground 2.1 s later, find the height of the building, H. (Ans: 22 m)

T041

Q3 A man runs on a straight road for 8.0 km at a speed of 8.0 km/h. He then continues in the same direction for another 6.0 km at a speed of 12 km/h. What is his average speed during this 14 km run? (A1) 9.3 km/h.

Q4 A stone is thrown vertically upward with an initial speed of 10 m/s. What is its speed when it returns to a height of 3.83 m above its starting point? (Ans: 5.0 m/s) .

Q5 A particle moves along the x axis. Its position from its starting point as a function of time t is given in Fig 2. What is the total distance that this particle travels from t=0 to t=6.0 s? (Ans: 12 m)

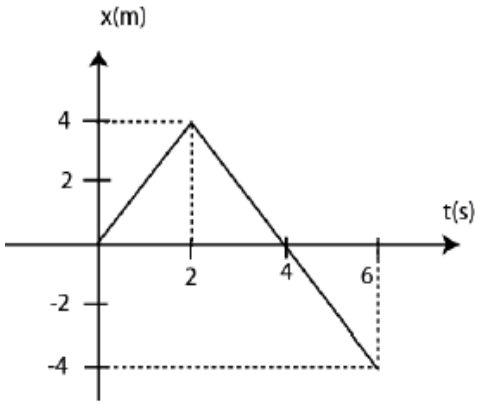


Figure 2

Q6 A particle starts from Xo = 10 m at time to = 0. Its velocity (v) as a function of time (t) is as shown in Fig 1. Find the position (X) of the particle at time t = 3.0 s. (Ans: 28 m)

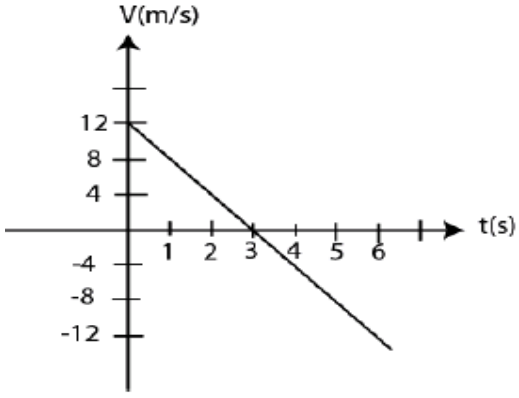
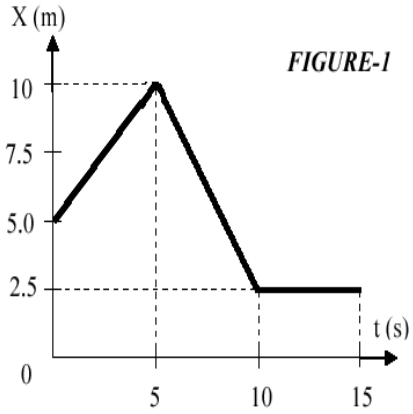


Figure 1

T031

Q2 Fig. 1 shows a graph of position versus time for a particle moving along the x axis. What is the total distance travelled by the particle in 15 s? (Ans: 12.5 m).



Q3 An object starts from rest at the origin and moves along the x-axis with a constant acceleration of 5.0 m/s^2. Find its average velocity as it goes from x = 0 m to x = 10 m. (Ans: 5.0 m/s.)

Q4. Starting at time t = 0, an object moves along a straight line with a velocity in m/s given by v = 72 - 2 t^2, where t is in seconds. Find its acceleration when it stops momentarily. (Ans: -24 m/s^2)

Q5 A stone is thrown vertically upward with an initial speed of 15 m/s. What is its speed at a height of 10 m from its release point? (Ans: 5.4 m/s)