



Page 43

Solution 53

(i) The distance covered from A to B is $(3-0) = 3$ cm

Time taken to cover the distance from A to B $= (5-2) = 3$ s

(ii) The speed of the body as it moves from B to C is zero.

(iii) The distance covered from C to D is $(7-3) = 4$ cm

Time taken to cover the distance from C to D $= (9-7) = 2$ s

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Time taken to cover the distance from A to B $= (5-2) = 3$ s

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed} = \frac{3\text{cm}}{3\text{sec}} = 1 \text{ cm/s}$$

(ii) The speed of the body as it moves from B to C is zero.

(iii) The distance covered from C to D is $(7-3) = 4$ cm

Time taken to cover the distance from C to D $= (9-7) = 2$ s

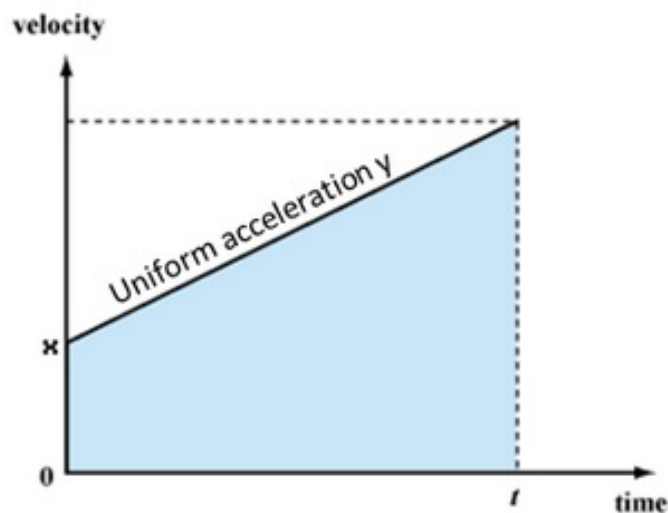
$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{4\text{cm}}{2\text{sec}} = 2\text{cm/s}$$

Solution 54

(a) The body has a uniform velocity if its displacement-time graph is a straight line.

(b) The body has a uniform acceleration if its velocity-time graph is a straight line.

Solution 55



Solution 56

(i) BC represents uniform velocity. From graph, we see that the velocity of the body at point C $= 40\text{km/h}$

(ii) Acceleration between A and B $=$ slope of line AB

(iii) BC represents uniform velocity, so acceleration acting on the body between B and C is zero.

(i) BC represents uniform velocity. From graph, we see that the velocity of the body at point C = 40 km/h

(ii) Acceleration between A and B = slope of line AB

$$= \frac{(40 - 20) \text{ km/h}}{(3 - 0) \text{ h}} = 6.66 \text{ km/h}^2$$

(iii) BC represents uniform velocity, so acceleration acting on the body between B and C is zero.

Solution 57

Distance travelled = Area of rectangle OABC

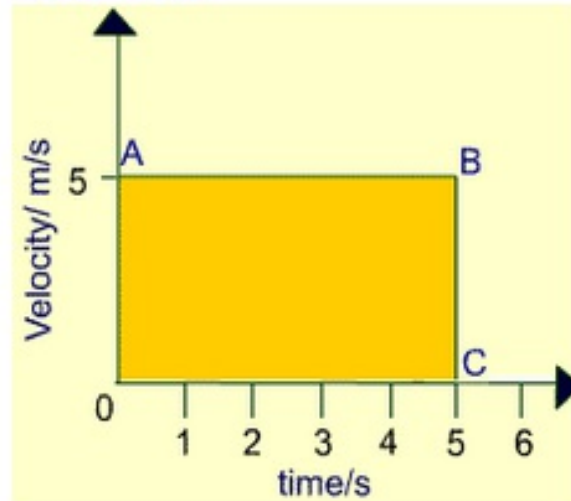
= OA x OC

= 5 x 5 = 25 m

Distance travelled = Area of rectangle OABC

= OA x OC

= 5 x 5 = 25 m



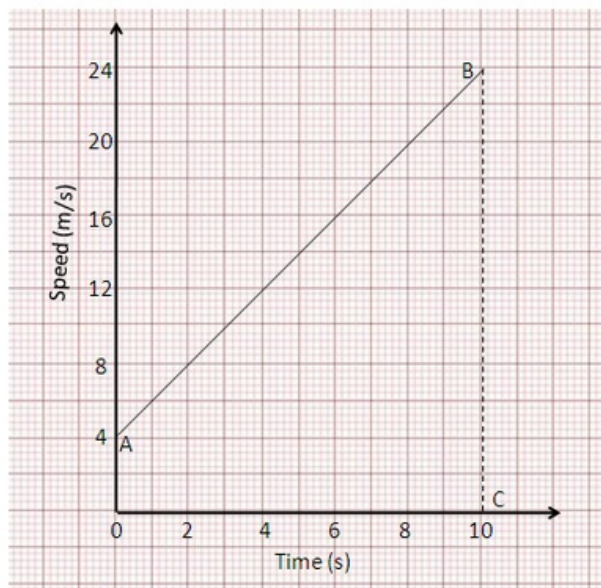
Solution 58

(i) Acceleration during first two seconds = $\frac{4.6 - 0}{2 - 0} = 2.3 \text{ m/s}^2$

(ii) Acceleration between second and tenth second is zero, since the velocity is constant during this time.

(iii) Acceleration during last two seconds = $\frac{0 - 4.6}{12 - 10} = -2.3 \text{ m/s}^2$

Solution 59



(i) Acceleration of the car = slope of line AB = $\frac{24 - 4}{10 - 0} = \frac{20}{10} = 2 \text{ m/s}^2$

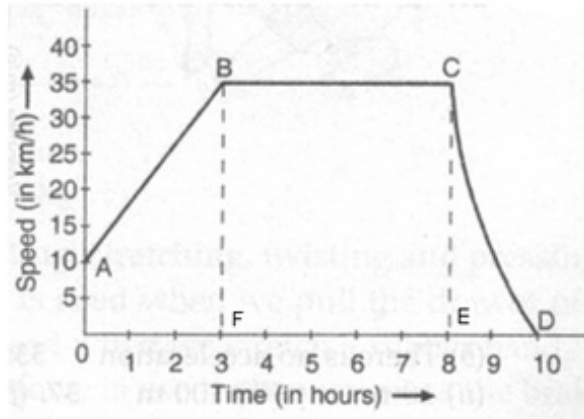
(ii) Distance travelled by the car in 10s = area of trapezium OABC

$$= \frac{1}{2} \times (OA + BC) \times OC$$

$$= \frac{1}{2} \times (4 + 24) \times 10 = 140 \text{ m}$$

Solution 60

- (i) Initial speed of the car=10km/h
- (ii) Maximum speed attained by the car= 35km/h
- (iii) BC represents zero acceleration.
- (iv) CD represents varying retardation.
- (v)
- (i) Initial speed of the car=10km/h
- (ii) Maximum speed attained by the car= 35km/h
- (iii) BC represents zero acceleration.
- (iv) CD represents varying retardation.
- (v)



Distance travelled in first 8 hrs:

$s = \text{Area of trapezium OABF} + \text{Area of rectangle BCEF}$

$$= \frac{1}{2} \times (OA + BF) \times OF + BF \times FE$$

$$= \frac{1}{2} \times (10 + 35) \times 3 + (35 \times 5)$$

$$= 67.5 + 175$$

$$= 242.5 \text{ km}$$

Solution 61

- (i) Graph (c): The speed of the ball goes on decreasing uniformly as it moves upward, reaches zero at the highest point, and then increases uniformly as it moves downward.
- (ii) Graph (a): The speed of the trolley decreases uniformly, then it moves at a constant speed, and then the speed increases uniformly.

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