



# PHYSICS

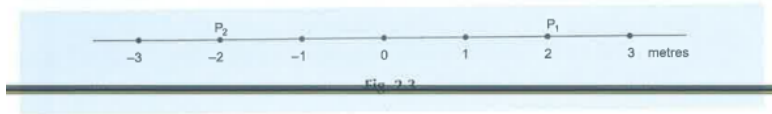
## BOOKS - HC VERMA

### DESCRIBING MOTION

#### Question Bank

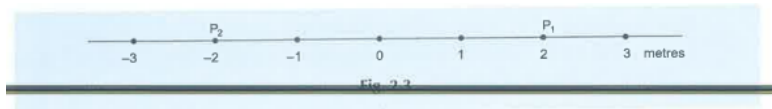
1. Consider the situation shown In Figure 2.3.  
What is the position of a particle when it is at

$P_1$  and when it is at  $P_2$ ?



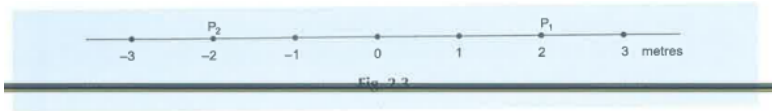
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2. Consider the situation shown In Figure 2.3. Are the two positions the same?



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3. Consider the situation shown In Figure 2.3. Are the two distances of the particle from the particle from the origin the same ?



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4. The position of a particle going along a straight line is  $x=50\text{m}$  at 10.30 a.m. and  $x= 55 \text{ m}$  at 10.35 a.m.



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5. Convert 15 m/s into km/h



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6. A boy throws a ball up and catches it when the ball falls back. In which part of the motion is the ball decelerating ?



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7. Figure 2.12 shows distance-time graphs of two objects A and B. Which object is moving with a greater speed when both are moving ?

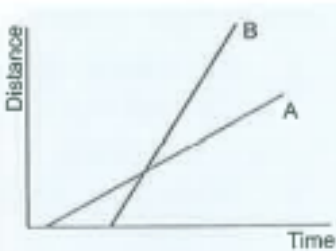


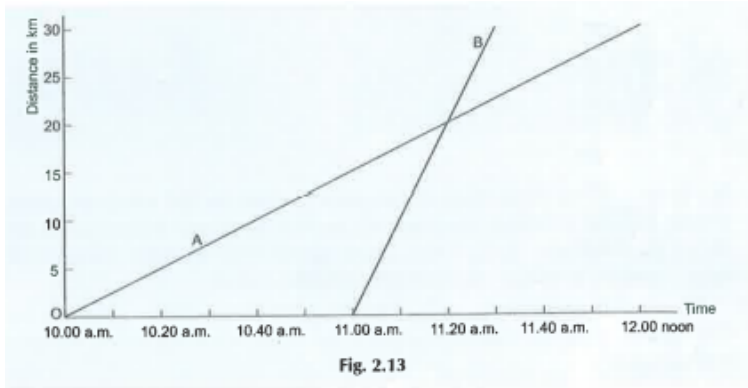
Fig. 2.12



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8. Two friends A and B started from the same location and went 30 km along a road in the

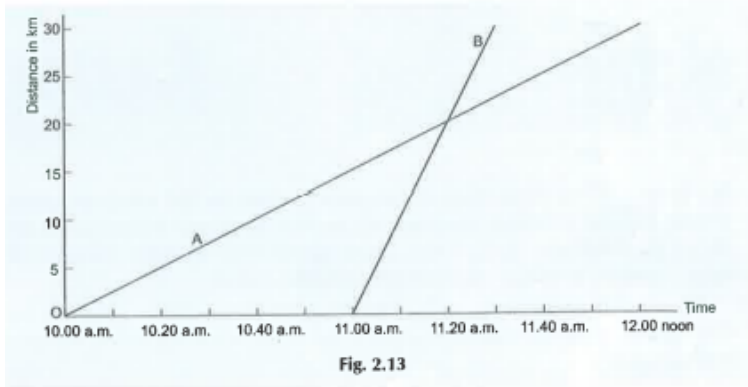
same direction. Figure 2.13 shows their motions through graphs. Answer. The following question. When did A start ?



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9. Two friends A and B started from the same location and went 30 km along a road in the same direction. Figure 2.13 shows their

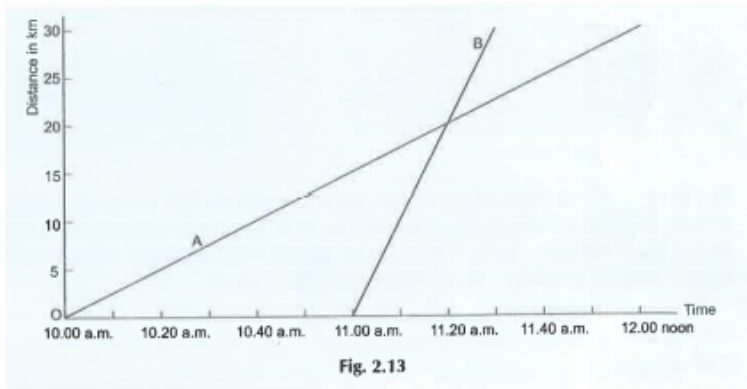
motions through graphs. Answer. The following question. When did B start ?



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**10.** Two friends A and B started from the same location and went 30 km along a road in the same direction. Figure 2.13 shows their motions through graphs. Answer. The

following question. Did any of them move with uniform speed ?

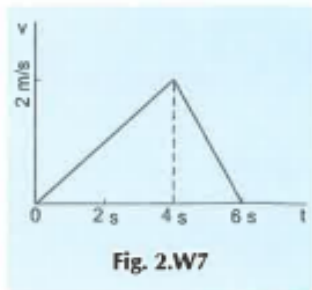


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**11.** The velocity-time graph of a particle moving along a straight line is shown in Figure 2.W7. Is



the motion uniform?

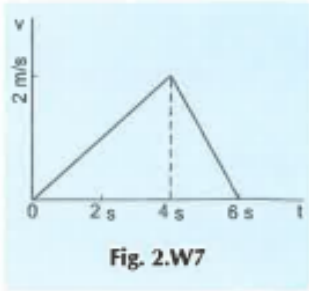


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**12.** The velocity-time graph of a particle moving along a straight line is shown in Figure 2.W7.

Does the particle change its direction of

motion ?



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**13.** A particle is travelling with a constant speed. This means

- A. its position remains constant as time passes
- B. It covers equal distances in equal time intervals
- C. its acceleration is zero
- D. It does not change its direction of motion

**Answer: B**



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14. A particle moves with a uniform velocity.

- A. The particle must be at rest.
- B. The particle moves along a curved path.
- C. The particle moves along a circle.
- D. The particle moves along a straight line

**Answer: D**



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15. If a particle covers equal distances in equal time intervals, It is said to

A. be at rest

B. move with a uniform speed

C. move with a uniform velocity

D. move with a uniform acceleration

**Answer: B**



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**16.** A quantity has a value of  $-6.0 \text{ m/s}$ . It may be the

- A. speed of a particle
- B. velocity of a particle
- C. acceleration of a particle
- D. position of a particle

**Answer: B**



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17. The area under a graph between two quantities is given in the unit  $\text{m/s}$ . The quantities are

- A. speed and time
- B. distance and time
- C. acceleration and time
- D. velocity and time

**Answer: C**



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18. The area under a speed -time graph is represented by the unit

A. m

B.  $m^2$

C.  $m^3$

D.  $m^{-1}$

**Answer: A**



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19. The velocity-time graph of a particle is not a straight line. Its acceleration is

A. zero

B. constant

C. negative

D. variable

**Answer: D**



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20. If a particle moves with a constant speed, the distance-time graph is

A. straight line

B. circle

C. stairlike line

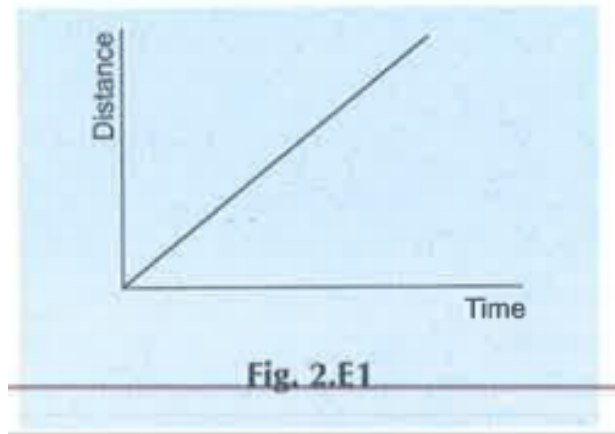
D. polygon

**Answer: A**



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21. The distance-time graph of an object moving in a fixed direction is shown in figure 2.E1.



The object

- A. is at rest
- B. moves with a constant velocity
- C. moves with a variable velocity

D. moves with a constant acceleration

**Answer: B**



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**22.** The distance-time graph of an object shown in figure 2.E2.

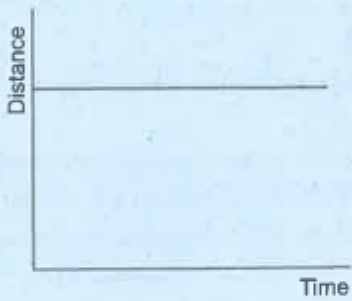


Fig. 2.E2

The object

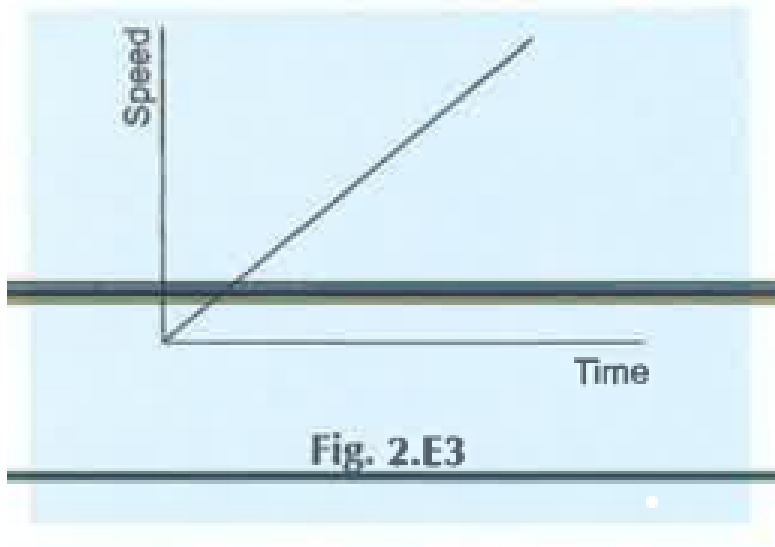
- A. is at rest
- B. moves with a constant speed
- C. moves with a constant velocity
- D. moves with a constant acceleration

**Answer: A**



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23. The speed-time graph of an object moving in a fixed direction is shown in figure 2.E3.



The object

A. is at rest

B. moves with a constant speed

C. moves with a constant velocity

D. moves with a constant acceleration

**Answer: D**



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**24.** The speed-time graph of an object moving in a fixed direction is shown in Figure 2.E4.



Fig. 2.E4

The object

- A. is at rest
- B. moves with fluctuating speed
- C. moves with a constant speed
- D. moves with a nonzero acceleration

**Answer: C**





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25. In circular motion the

A. direction of motion is fixed

B. direction of motion changes  
continuously

C. acceleration is zero

D. velocity is constant

**Answer: B**



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**26.** Mark the statement true (T) or false (F). If A moves with respect to B then B moves with respect to A.



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**27.** Mark the statement true (T) or false (F). Scalar quantities can be added according to the rules of arithmetic.



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**28.** Mark the statement true (T) or false (F).

The magnitude of the displacement of a particle can be greater than the distance traversed.



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**29.** Mark the statement true (T) or false (F).

The magnitude of the displacement of a particle can be equal to the distance traversed.



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**30.** Mark the statement true (T) or false (F). Vector quantities can be added according to the rules of arithmetic.



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**31.** Mark the statement true (T) or false (F). The displacement of a particle in a 10-minute interval must be zero.



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**32.** Mark the statement true (T) or false (F). A particle is known to be at rest at time  $t=0$ . Its acceleration at  $t=0$  must be zero.



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**33.** Mark the statement true (T) or false (F). For a particle moving with a constant velocity, the distance- time graph is a straight line.



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**34.** Mark the statement true (T) or false (F). For a particle moving with a constant acceleration along a straight line, the velocity- time graph is a straight line.



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**35.** A car moves 100 m due east and then 25 m due west. What is its displacement ?



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**36.** A person walks along the sides of a square field. Each side is 100 m long. What is the maximum magnitude of displacement of the person in any time interval?



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**37.** In the hare-tortoise race, the hare ran for 2 min at a speed of 7.5 km/h, slept for 56 min and aging ran for 2 min at a speed of 7.5 km/h . Find the average speed of the hare in the race.



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**38.** A boy leaves his house at 6.30 a.m. for his school. The school is 2 km away and classes start at 10.00 a.m. If he walks at a speed of 3 km/h for the second kilometre to reach just in time ?



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**39.** A bus moves at a uniform speed  $v_1$  for some time and then with a uniform speed  $v_2$ . The distance-time table is given below. Plot the corresponding distance-time graph and answer the following questions .

Time (min)	Distance (km)
0	0
20	20
40	40
60	65
80	95
100	125
120	155

Find the values of  $v_1$  and  $v_2$ .



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**40.** A bus moves at a uniform speed  $v_1$  for some time and then with a uniform speed  $v_2$ . The distance-time table is given below. Plot the corresponding distance-time graph and answer the following questions .

Time (min)	Distance (km)
0	0
20	20
40	40
60	65
80	95
100	125
120	155

When did the bus change its speed?



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**41.** A bus moves at a uniform speed  $v_1$  for some time and then with a uniform speed  $v_2$ . The distance-time table is given below. Plot the corresponding distance-time graph and answer the following questions .

Time (min)	Distance (km)
0	0
20	20
40	40
60	65
80	95
100	125
120	155

What is the average speed for the complete journey?



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**42.** A bicycle increases its velocity from 10 km/h to 15 km/h in 6 seconds. Calculate its acceleration.



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**43.** A bullet hits a wall with a velocity of 20 m/s and penetrates it up to a distance of 5 cm. Find the deceleration of the bullet in the wall.



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**44.** A train starts from a station and moves with a constant acceleration for 2 minutes. If it covers a distance of 400m in this period, find the acceleration.



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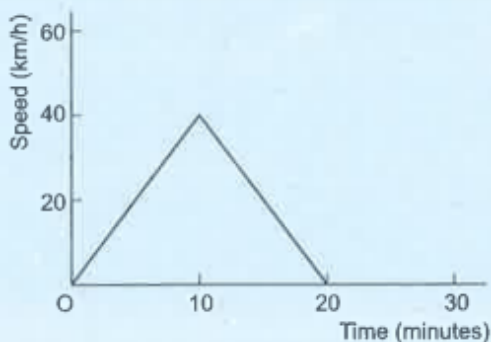
**45.** A bicycle moves with a constant velocity of 5 km/h for 10 minutes and then decelerates at the rate  $1k \frac{m}{h^2}$ , till it stops. Find the total distance covered by the bicycle.



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**46.** Figure 2.E6 shows the speed-time graph of a bus.





**Fig. 2.E6**

In which period is the bus accelerating ?



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**47.** Figure 2.E6 shows the speed-time graph of a bus.

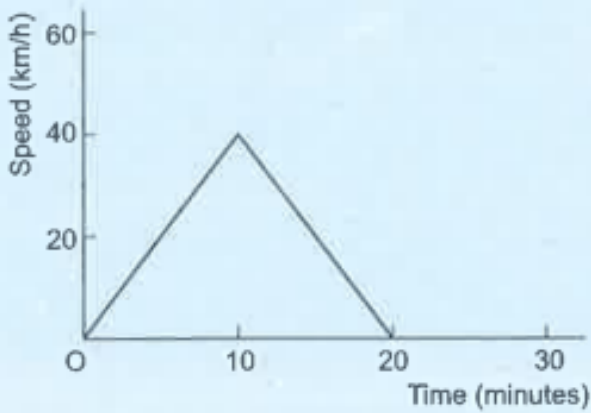
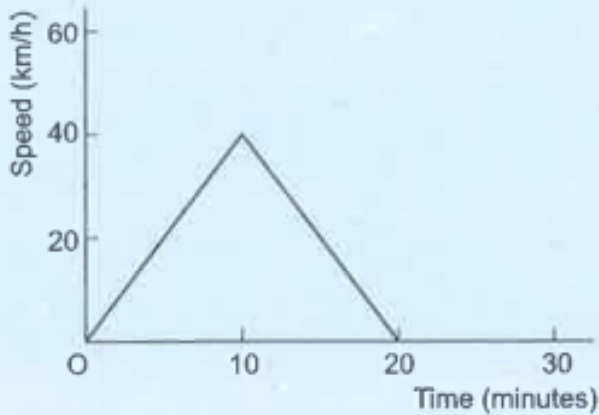


Fig. 2.E6

In which period is the bus decelerating ?

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**48.** Figure 2.E6 shows the speed-time graph of a bus.



**Fig. 2.E6**

What is the distance covered during its deceleration ?



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**49.** Figure 2.E6 shows the speed-time graph of a bus.

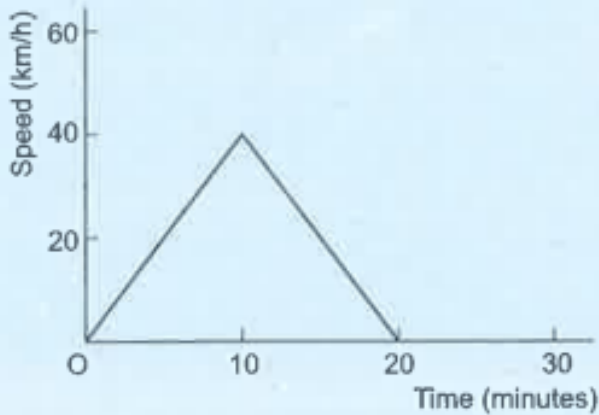


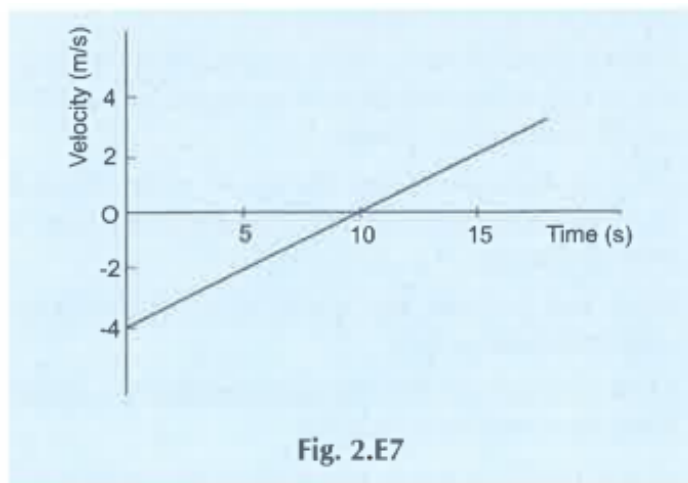
Fig. 2.E6

What is the distance covered during its deceleration ?

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50. The velocity-time graph of a particle moving along a straight line is given in Figure

2E7. Does the particle ever come to rest? If so, when?

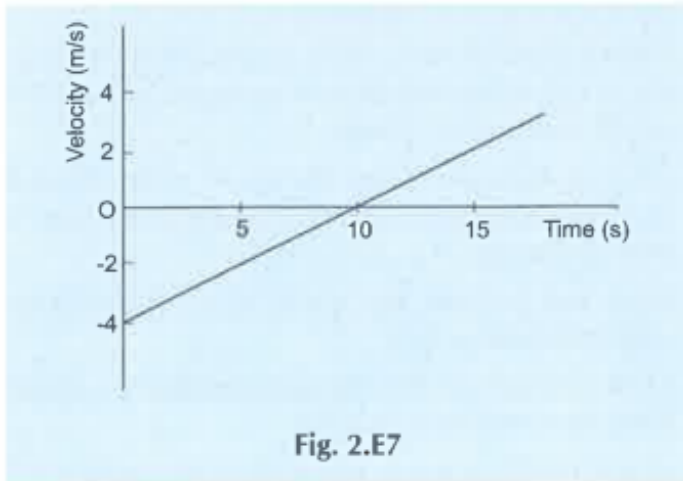


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51. The velocity-time graph of a particle moving along a straight line is given in Figure

2E7. Does the particle turn around? If so, when

?



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