Direction and Distance

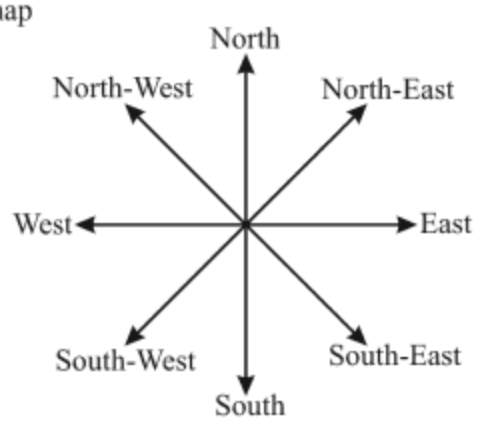
INTRODUCTION

This part of reasoning comes under the category of common sense reasoning. In fact, this segment gauges the sense of direction of a candidate. In every objective competitive examinations, these type of questions are asked. Particularly, in banking exams, these questions can be seen in every exam. This is the reason, examinees are required to pay special attention towards such questions.

Concept of Direction

In our day to day life, we make our concept of direction after seeing the position of sun. In fact, this is a truth that sun rises in the East and goes down in the west. Thus when we stand facing sunrise, then our front is called East while our back is called West. At this position our left hand is in the Northward and the right hand is in the Southward. Let us see the following direction map that will make your concept more clear:

Direction map

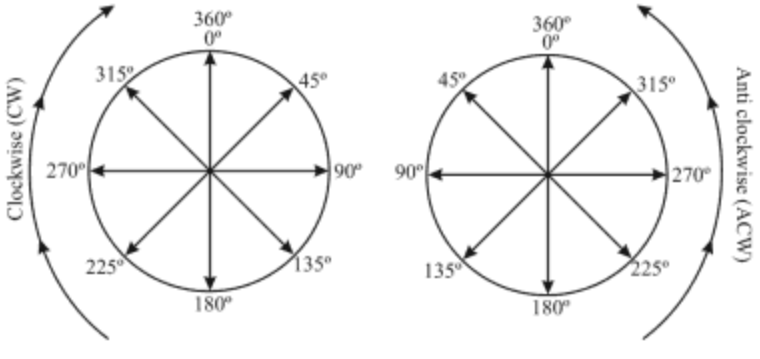


Note

On paper North is always on top be while South is always in bottom.

Concept of Degree

Let us see the following picture:

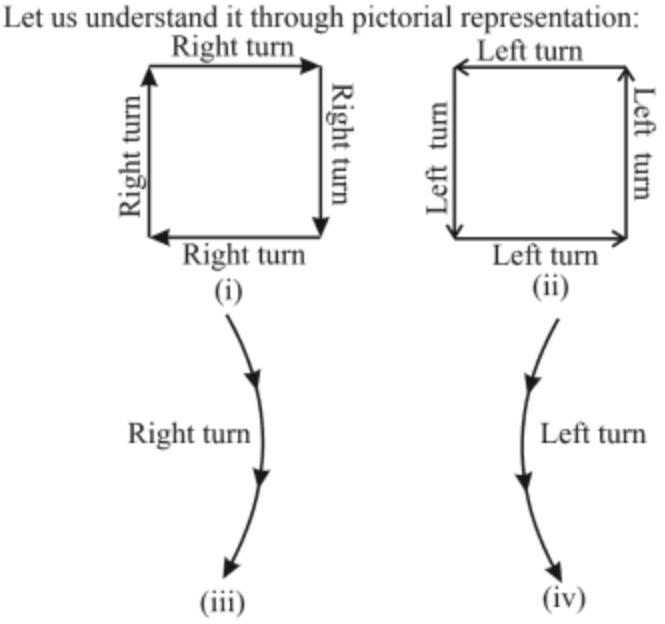


Concept of Turn

Right turn = Clockwise turn

Left turn = Anticlockwise turn

Let us understand it through pictorial representation:



Important Points Regarding Direction

- If our face is towards North, then after left turn our face will be towards West while after right turn, it will be towards East.
- If our face is towards South, then after left turn our face will be towards East and after right turn it will be towards West.
- If our face is towards East, then after left turn our face will be forwards North and after right turn it will be towards South.
- If our face is towards West, then after left turn our face will be towards South and after right turn it will be towards North.
- If our face is towards North-West, then after left turn our face will be towards South-West and after right turn it will be towards North-East.
- If our face is towards South-West, then after left turn our face will be towards South-East and after right turn it will be towards North-West.
- If our face is towards South-East, then after left turn our face will be towards North-East and after right turn it will be towards South-West.
- If our face is towards North-East, then after left turn our face will be towards North-West and after right-turn it will be towards South-East.

EXERCISE

1. Ashok started walking towards South. After walking 50 metres he took a right turn and walked 30 metres. He then took a right turn and walked 100 metres. He again took a right turn and walked 30 metres and stopped. How far and in which direction was he from the starting point ?
(a) 50 metres South (b) 150 metres North
(c) 180 metres East (d) 50 metres North

2. A school bus driver starts from the school, drives 2 km towards North, takes a left turn and drives for 5 km. He then takes a left turn and drives for 8 km before taking a left turn again and driving for 5 km. The driver finally takes a left turn and drives 1 km before stopping. How far and towards which direction should the driver drive to reach the school again?
(a) 3 km towards North (b) 7 km towards East
(c) 6 km towards South (d) 5 km towards North

3. Veena walked 5m towards north, took a left turn and walked 7 m. She took a left turn again and walked 8m before taking a left turn and walking 7 m. She then took a final left turn and walked 1 m before stopping. How far is Veena from the starting point ?
(a) 3 m (b) 6 m (c) 4 m (d) 2 m

4. Pole P is 13 km towards the East of Pole Q. Siddharth, starts from Pole Q, travels 8 km towards West and takes a right turn. After taking the right turn, he travels 5 km and reaches Pole B. From Pole B , Siddharth takes a right turn again, travels 21 km and reaches Pole C. How far and towards which direction must the Siddharth travel to reach Pole P?
(a) 5 km towards South (b) 5 km towards West
(c) 21 km towards South (d) 13 km towards South

5. Shiva, starting from his house, goes 5 km in the East, then he turns to his left and goes 4 km. Finally he turns to his left and goes 5 km. Now how far is he from his house and in what direction?
(a) In East, at a distance of 5 km
(b) In East, at a distance of 4 km
(c) In West, at a distance of 4 km
(d) In North, at a distance of 4 km

6. Suresh, starting from his house, goes 4 km in the East, then he turns to his right and goes 3 km. What minimum distance will be covered by him to come back to his house?
(a) 4 km (b) 5 km (c) 6 km (d) 7 km

7. One morning just after sunrise Aarya, while going to school, met Mona at Boring Road crossing. Mona shadow was exactly to the right of Aarya. If they were face to face, which direction was Aarya facing?
(a) East (b) North-East
(c) West (d) South

8. Hema, starting from her house, walked 5 km to reach the crossing of Palace. The direction in which she was going, a road opposite to that direction goes to Hospital. The road to the right goes to the station. If the road which goes to the station is just opposite to the road which goes to the IT-Park, then in which direction to Hema is the road which goes to the IT-Park?
(a) Right (b) Left
(c) Opposite (d) None of these

9. R is to the West of P. T is to the East of S. P is to the north of S. T is in which direction with reference to R?
(a) West (b) East
(c) North (d) None of these

10. Ram is facing South. Ramesh, walking towards him, stops, and turns to his right. He sees Umesh standing before him facing him. Which direction is Umesh facing?
(a) West (b) South
(c) East (d) Data inadequate

11. Pinky walks a distance of 600 metres towards east, turns left and moves 500 metres, then turns left and walks 600 metres and then turns left again and moves 500 metres and halts. At what distance in metres is she from the starting point?
(a) 0 (b) 2200 (c) 600 (d) 500

12. Q walked 20 metres towards West, took a left turn and walked 20 metres. He then took a right turn and walked 20 metres and again took a right turn and walked 20 metres. How far is Q now from the starting point?
(a) 40 metres (b) 50 meters
(c) 80 metres (d) Data inadequate

13. A postman was returning to the Post Office which was in front of him to the north. When the Post Office was 100 metres away from him, he turned to the left and moved 50 metres to deliver the last letter at Shanti Villa. He then moved in the same direction for 40 metres, turned to his right and moved 100 metres. How many metres away was he now from the Post Office?
(a) 0 metre (b) 150 metre
(c) 90 metre (d) 100 metre

14. Laxman went 15 km to the west from my house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left, covered 20 km. How far was he from my house?
(a) 5 km (b) 10 km (c) 40 km (d) 80 km

15. Kailash faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point?
(a) South-West (b) South
(c) North-West (d) South-East

16. Radhika walks 3.5 km to the west and then turns the south and walks 4 km. Again, she turns to the west and walks 6.5 km. Next, she turns and walks 4 km in north direction. How far is she now from her starting point ?
(a) 18 km (b) 6.5 km (c) 10 km (d) 12 km

17. Mohan walked 30 metres towards South, took a left turn and walked 15 metres. He then took a right turn and walked 20 metres. He again took a right turn and walked 15 metres. How far is he from the starting point ?
(a) 95 metres (b) 50 metres
(c) 70 metres (d) Cannot be determined

18. Alok walked 30 m towards East and took a right turn and walked 40 m. He again took a right turn and walked 50 m. Towards which direction is he from his starting point?
(a) South (b) West
(c) South-West (d) South-East

19. One morning Sujata started to walk towards the Sun. After covering some distance she turned to right then again to the right and after covering some distance she again turns to the right. Now in which direction is she facing ?
(a) North (b) South
(c) North-East (d) South-West

20. Radha moves towards South-East and travels a distance of 7 kms, then she moves towards West and travels a distance of 14 kms. From here she moves towards North-West and travels a distance of 7 kms and finally she moves a distance of 4 kms towards East. How far is she now from the starting point ?
(a) 3 kms (b) 4 kms (c) 10 kms (d) 11 kms

21. I am facing East. I go 20 metres, then turning to the left I go 20 metres, then after turning to the right I go 40 metres and then I go 40 metres to the right. Now in which direction am I from my original position?
(a) North-West (b) West
(c) South-East (d) East

22. Rahul travelled from a point and goes straight to point 'Y' at a distance of 90 metres. He turned right and walked 40 metres, then again right and walked 70 metres. Finally, he turned right and walked 40 metres. How far is he from the starting point?
(a) 70 metres (b) 10 metres
(c) 20 metres (d) 30 metres

23. A boy rode his bicycle Northward, then he turned left and rode 1 km and again turned left and rode 2 km. He found himself 1 km west of his starting point. How far did he ride northward initially?
(a) 1 km (b) 2 km (c) 3 km (d) 5 km

24. Y is in east to X which is north to Z. If P is in west to Z, then P is in which directions of Y ?
(a) North (b) East
(c) South-East (d) South-West

25. A boy walks from a certain point to Priya, meets Riya and then Siya and after this he meets Jiya and then Diya. Find the total distance cover by the boy if the distance between boy and Priya is 30 m, distance between priya and Siya is 85 m, Riya and Jiya is 75 m and Siya and Diya is 65m and all girls are standing in a straight line.
(a) 180 m (b) 215 m (c) 225 m (d) 165 m

DIRECTIONS (Qs. 26-28): *Read the following information carefully and answer the questions given below.*

The city K is 30 km to the southeast of Z while Y is 50 km to the northwest of K. Also, H is 38 km to the southeast of Y. L lies in the direct route between Y and K and its distance from H is 14 km. G also lies on this route and is exactly midway between L and Y.

26. A car starting from K at 9 a.m. and running at a constant speed towards Y reaches H at 9.24 a.m. and then reaches G at
(a) 9.18 a.m. (b) 10.16 a.m.
(c) 10.36 a.m. (d) 10.42 a.m.

27. If M is 1 km to the southeast of L, then it is exactly midway between
(a) H and L (b) Y and K
(c) H and Z (d) None of these

28. The distance from G to H is
(a) 26 km (b) 24 km
(c) 12 km (d) 16 km

DIRECTIONS (Qs. 29-32): *Read the following information carefully and answer the questions given below.*

All the streets of a city are either perpendicular or parallel to one another. The streets are all straight. Streets N, O, P, Q and R are parallel to one another. Streets S, T, U, V, W, X and Y are horizontally parallel to one another,
(i) Street N is 1 km east of Street O.
(ii) Street O is 1/2 km west of Street P.
(iii) Street Q is 1 km west of Street R.
(iv) Street S is 1/2 km south of Street T.
(v) Street U is 1 km north of Street V.
(vi) Street W is 1/2 km north of Street X.
(vii) Street W is 1 km south of Street Y.

29. If W is parallel to U and W is 1/2 km south of V and 1 km north of T, then which two streets would be 1 & 1/2 km apart?
(a) U and W (b) V and S
(c) V and T (d) W and V

30. Which of the following possibilities would make two streets coincide ?
(a) X is 1/2 km north of U (b) P is 1 km west of E
(c) O is 1/2 km east of N (d) R is 1/2 km east of O

31. Street R is between O and P, then the distance between P and R is
(a) 1/2 km (b) 1 km
(c) 1.5 km (d) 1.25 km

32. R is between O and P, then which of the following is false ?
(a) Q is 1.75 km west of N
(b) P is less than 1 km from Q
(c) R is less than 1 km from N
(d) Q is less than 1 km from O

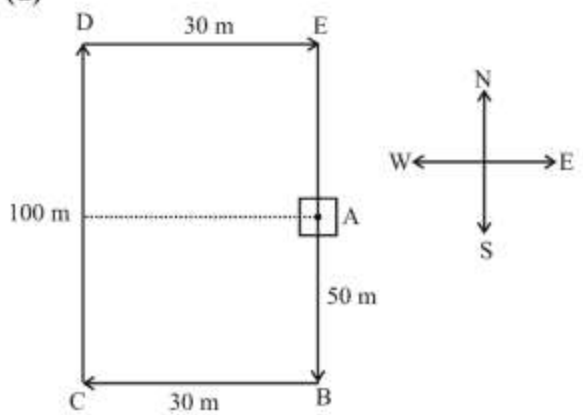
33. Which of the following is necessarily true ?
(a) R and O Intersect
(b) Q is 2 km west of O
(c) Y is 1.5 km north of X
(d) Q is at least 2 km west of N

34. A man walks 1 km towards East and then he turns to South and walks 5 kms. Again he turns to East and walks 2 kms. After this he turns to North and walks 9 kms. Now, how far is he from his starting point?
(a) 9 kms (b) 4 kms
(c) 10 kms (d) 5 kms

35. Starting from a point M, Rohit walked 18 m towards South. He turned to his left and walked 25 m. He then turned to his left and walked 25 m. Then he turned to his left and walked 18 m. He again turned to his left and walked 35 m and reached a point P. What is the direction of P in respect of M ?
(a) North (b) East
(c) West (d) South-East

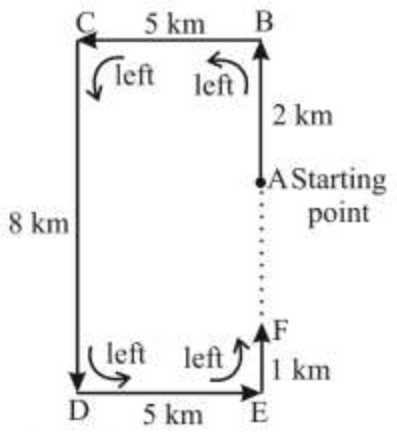
Hints & Solutions

1. (d)



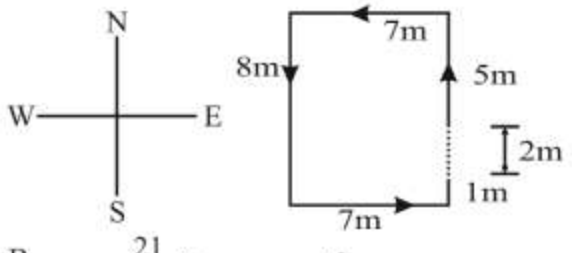
Required distance = (BE – AB) = (100 – 50) m = 50 m
Direction ⇒ North

2. (d)

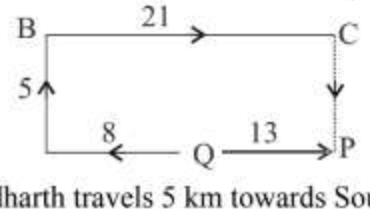


According to questions.
AB = 2 km
BC = 5 km
CD = 8 km
DE = 5 km
EF = 1 km
BC = DE = 5 km
CD = BE = 8 km
BE = EF + AF + AB
∴ AF = BE – (EF + AB)
= 8 – (1 + 2) = 8 – 3 = 5 km
∴ Required distance = AF = 5 km and required direction is North

3. (d)

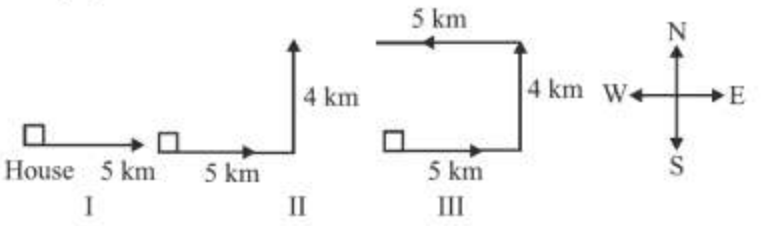


4. (a)



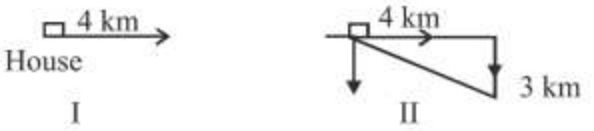
Sidharth travels 5 km towards South to reach Pole P.

5. (d)



From third position it is clear he is at 4 km from his house and is in North direction.

6. (b)

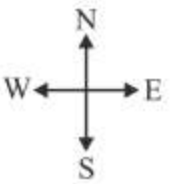


Minimum distance = $\sqrt{(4)^2+(3)^2}$

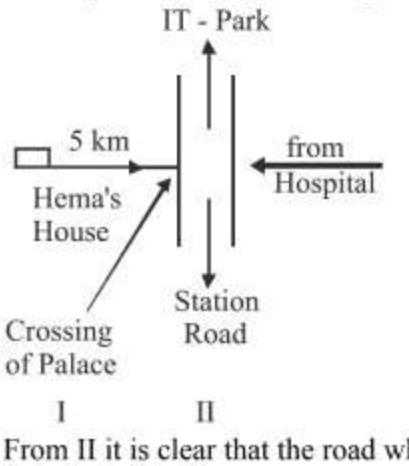
$= \sqrt{16+9} \quad = \sqrt{25}$

$= 5$ km

7. (d) In the morning the sun rises in the east. So in the morning the shadow falls towards the west.
Now Mona's shadow falls to the right of the Aarya Hence Aarya is facing South.

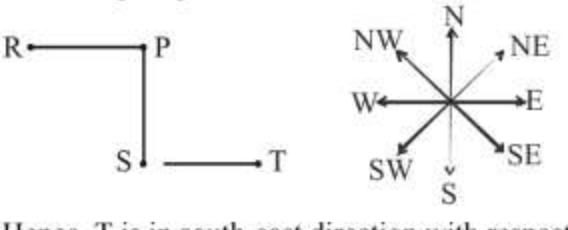


8. (b)



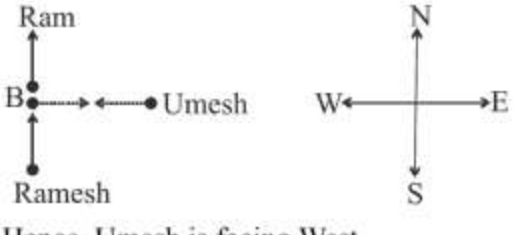
From II it is clear that the road which goes to IT-Park is to the left to Hema.

9. (d) According to question,



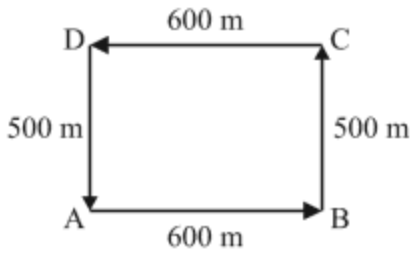
Hence, T is in south-east direction with respect to R

10. (a)

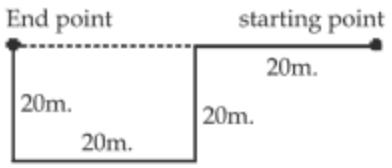


Hence, Umesh is facing West

11. (a)

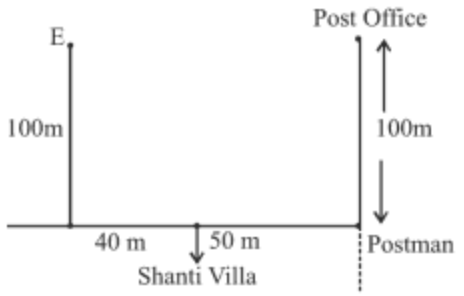


12. (a)



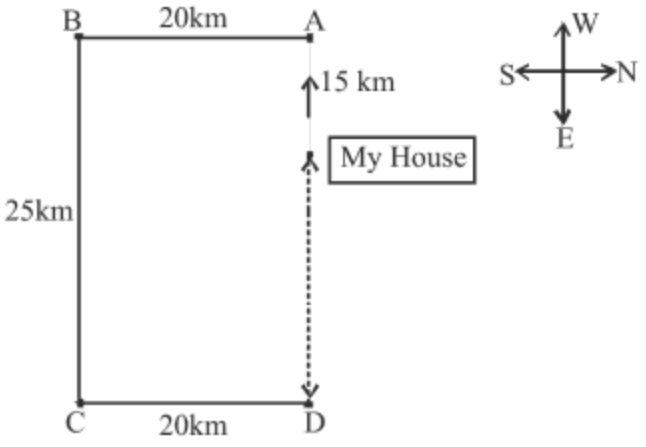
∴ Distance from starting point = 20 + 20 = 40 m

13. (c)



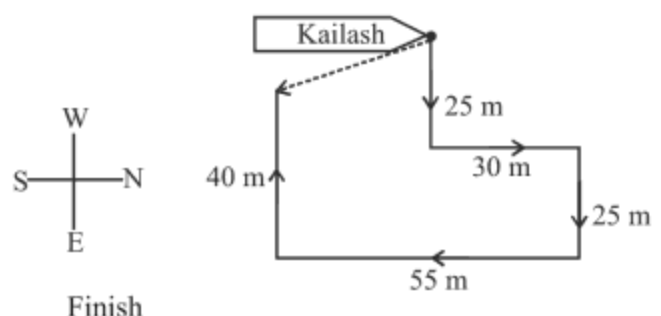
From the diagram, E is the final point where postman has reached. Hence his distance from the post office = 40 + 50 = 90m.

14. (b)

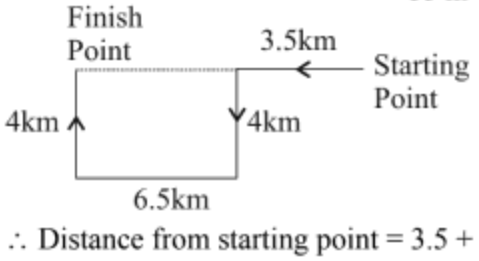


From the above diagram, required distance = 25 – 15 = 10 km.

15. (d)

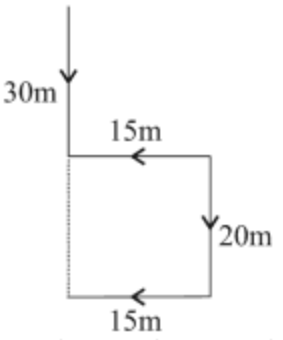


16. (c)



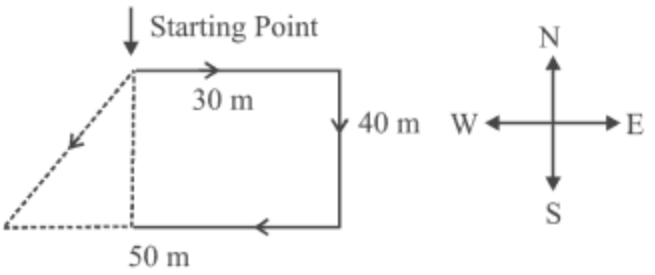
∴ Distance from starting point = 3.5 + 6.5 = 10 km

17. (b)

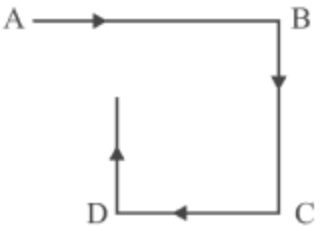


∴ Distance from starting point = 30 + 20 = 50m

18. (c)

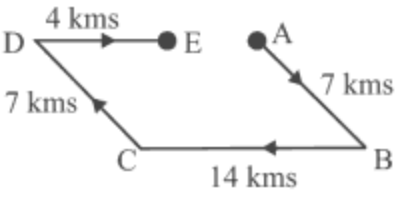


19. (a)



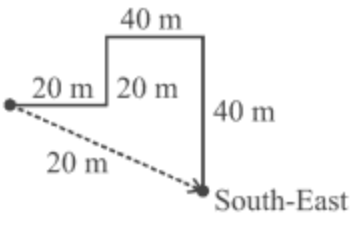
Hence finally Sujata is facing towards North.

20. (c)

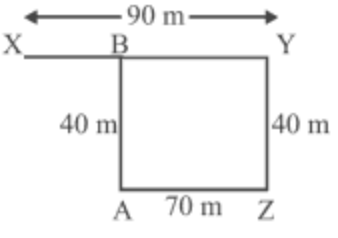


Required distance = AE = 14 – 4 = 10 kms

21. (c) It is clear from the diagram that I am in South-East direction with respect to the original position.

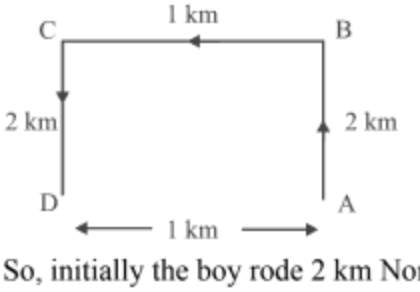


22. (c)



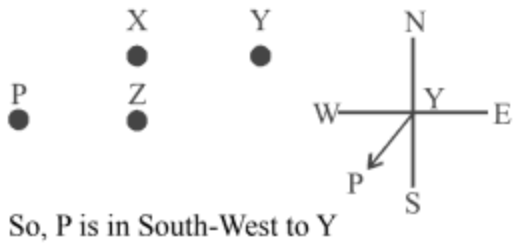
∴ Required distance = XB = 90 – 70 = 20 metre

23. (b)



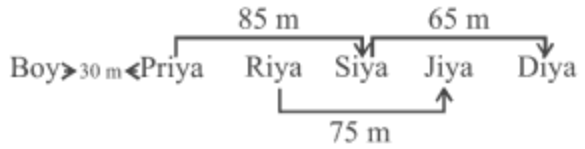
So, initially the boy rode 2 km Northward.

24. (d)



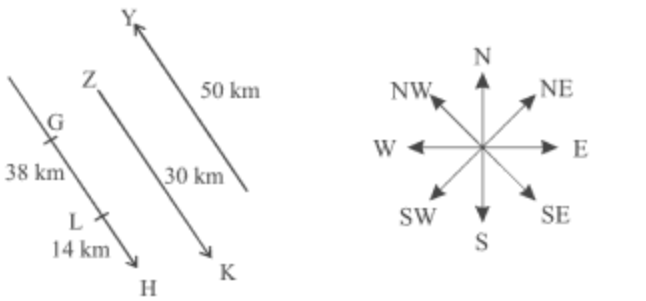
So, P is in South-West to Y

25. (a)



Required distance = 30 + 85 + 65 = 180 m

Sol. (26-28):



26. (b) A car starting from K at 9 am and running at a constant speed towards Y reaches H at 9.24 am and then reaches G at 10.16 am.

27. (b) If M is 1 km to the south east of L, then it is exactly midway between Y and K.

28. (a) The distance from G to H is 26 km.

Sol. (29-32): The vertical North South streets are N, O, P, Q, R. From the basic information we have two relative positions are available – one between O, P and N and the other between Q and R.

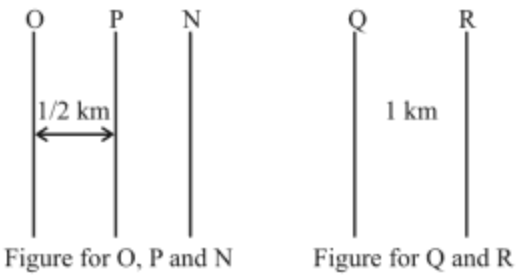
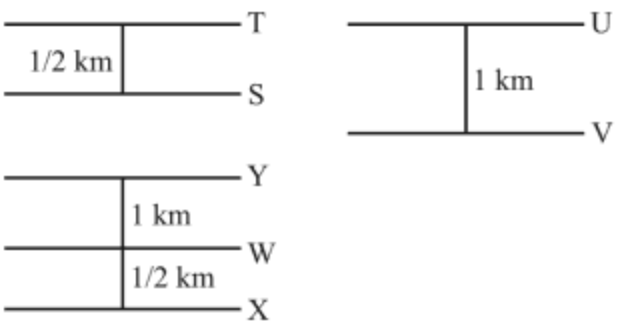
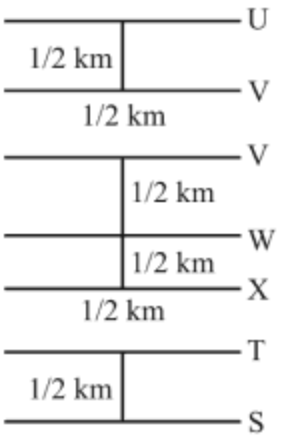


Figure for O, P and N Figure for Q and R

The horizontal east west streets are: S, T, U, V, W, X, Y. of these seven streets the relative positioning is given in 3 distinct part as shown here:



29. (a) If W is parallel to U and W is 1/2 km south of V and 1 km north of T, then U and W two streets would be 1 & 1/2 km apart.



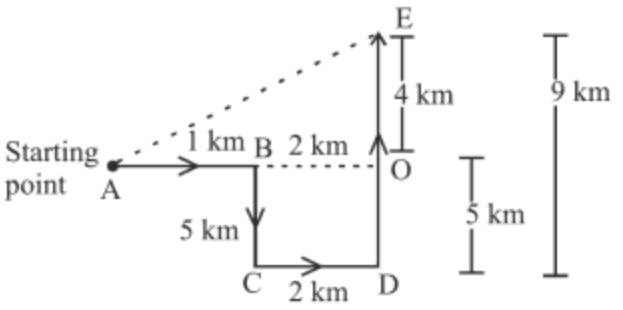
30. (d) If R is 1/2 km east of O, then R and P would coincide. Option (d) makes two streets coincide.

31. (d) If R is placed between O and P. Q to N would be a minimum of 1.5 and a maximum of 2 kms. Option (d) correct.

32. (b) If R is between O and P, then Q being 1 km to the west of R, would be more than 1 km to the west of P. Option (b) is false.

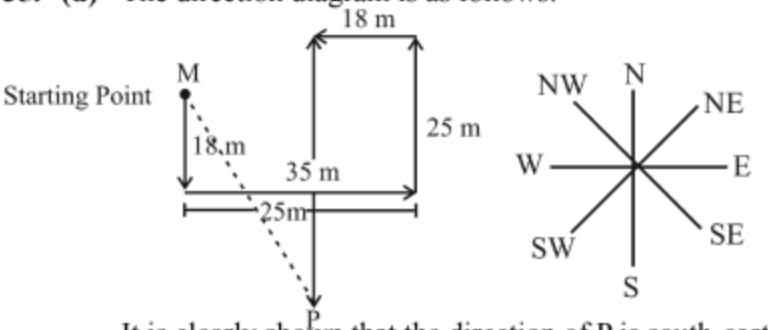
33. (d) Y is 1.5 km north of X is correct in all cases as the figure between X, W and Y shows. Option (d) is correct.

34. (d) The direction diagram of a man is as follows:



BO = CD = 2 km
and AB + BO = AO
1 + 2 = 3 km
In ΔAOE,
$AE^2 = EO^2 + OA^2$
$AE^2 = 4^2 + 3^2$
$AE^2 = 16 + 9$
$AE^2 = 25$
AE = 5 km.

35. (d) The direction diagram is as follows:



It is clearly shown that the direction of P is south-east in respect of M.