Chapter - 11

DIRECTION & DISTANCE

Answer Key with **Step-by-Step Solutions**
Includes: All MCQs + **Extra PYQs** with Detailed Explanations

Previous Year Questions

1. Going 50 m to the South of her house, Radhika turns left and goes another 20 m. Then, turning to the North, she goes 30 m and then starts walking to her house, in which direction is she walking now?
   (a)North-west (b) North
   (c) South-east (d) East
2. I am facing South. I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. in which direction am I from the starting point?
   (a)North (b) North-west
   (c) East (d) North-east
3. Aditya starts from his house towards West. After walking a distance of 30 metres, he turned towards right and walked 20 metres. He then turned left and moving a distance of 10 metres, turned to his left again and walked 40 metres. He now turns to the left and walks 5 metres. Finally he turns to his left. In which direction is he walking now?
   (a) North (b) South
   (c) East (d) South-west
4. You go North, turn right, then right again and then go to the left. In which direction are you now?
   (a) North (b) South
   (c) East (d) West
5. Deepak starts walking straight towards east. After walking 75 meters, he turns to the left and walks 25 metres straight. Again the turns to the left, walks a distance of 40 meters straight, again he turns to the left and walks a distance of 25 metres. How far is he from the starting point?
   (a) 25 metres (b) 50 metres
   (c) 115 metres (d) None of these

6. Kunal walks 10 kilometres towards North. From there, he walks 6 kilometres towards South. Then, he walks 3 kilometres towards East. How far and in which direction is he with reference to his starting point?
(a) 5 kilometres West (b) 5 kilometres North-east
(c) 7 kilometres East (d) 7 kilometres West

7. Rohan walks a distance of 3 km towards North, then turns to his left and walks for 2 km. he again turns left and walks for 3 km. At this point he turns to his left and walks for 3 km. how many kilometers is he from the starting point?
(a) 1 km (b) 2 km
(c) 3 km (d) 5 km

8. Manick walked 40 metres towards North, took a left turn and walked 20 metres. He again took a left turn and walked 40 metres. How far and in which direction is he from the starting point?
(a) 20 metres East (b) 20 metres North
(c) 20 metres South (d) None of these

9. Namita walks 14 metres towards west, then turns to her right and walks 14 metres and then turns to her left and walks 10 metres. Again turning to her left she walks 14 metres. What is the shortest distance (in metres) between her starting point and the present position?
(a)10 (b) 24
(c) 28 (d) 38

10. A man leaves for his office from his house. He walks towards East. After moving a distance of 20 m, he turns South and walks 10 m. then he walks 35 m towards the West and further 5 m towards the North. He then turns towards East and Walks 15 m. What is the straight distance (in Metres) between his initial and final positions?
(a) 0 (b) 5
(c) 10 (d) Cannot be determined

11. Radha moves towards South-east a distance of 7 km, then she moves towards West and travels a distance of 14 m. From here, she moves towards North-west a distance of 7 m and finally she moves a distance of 4 m towards East and stood at that point. How far is the starting point from where she stood?
(a) 3 m (b) 4 m
(c) 10 m (d) 11 m

12. Amit walked 30 metres towards East, took a right turn and walked 40 metres. Then he took a left turn and walked 30 metres. In which direction is he now from the starting point?
(a) North-east (b) East
(c) South-east (d) South

13. A person starts from a point A and travels 3 km eastwards to B and then turns left and travels thrice that distance to reach C. He again turns left and travels five times the distance he covered between A and B and reaches his destination D. the shortest distance between the starting point and the destination is
(a)12 km (b) 15 km
(c) 16 km (d) 18 km

14. A girl leaves from her home. She first walks 30 metres in North-west direction and then 30 metres in South-west direction. Next, she walks 30 metres in South-east direction. Finally, she turns towards her house. In which direction is she moving?
(a)North-east (b) North-west
(c) South-east (d) South-west

15. Sanjeev walks 10 metres towards the South. Turning to the left, he walks 20 metres and then moves to his right. After moving a distance of 20 metres, he turns to the right and walks 20 metres. Finally, he turns to the right and moves a distance of 10 metres. How far and in which direction is he from the starting point?
(a)10 metres North
(b) 20 metres South
(c) 20 metres North
(d) 10 metres South

16. Kashish goes 30 metres North, then turns right and walks 40 metres, then again turns right and walks 20 metres, then again turns right and walks 40 metres. How many metres is he from his original position?
(a)0 (b) 10
(c) 20 (d) 40

17. A man walks 30 metres towards South. Then, turning to his right, he walks 30 metres. Then, turning to his left, he walks 20 metres. Again, he turns to his left and walks 30 metres. How far is he from his initial position?
(a)20 metres (b) 30 metres
(c) 60 metres (d) None of these

18. Rohit walked 25 metres towards South. Then he turned to his left and walked 20 metres. He then turned to his left and walked 25 metres. He again turned to his right and walked 15 metres. At what distance is he from the starting point and in which direction?
(a) 35 metres East (b) 35 metres North
(c) 40 metres East (d) 60 metres East

19. Starting from a point P, Sachin walked 20 metres towards South. He turned left and walked 30 metres. He then turned left and walked 20 metres. He again turned left and walked 40 metres and reached a point Q. How far and in which direction is the point Q from the point P?

(a) 20 metres West (b) 10 metres East
(c) 10 metres West (d) 10 metres North

20. Ramakant walks northwards. After a while, he turns to his right and a little further to his left. Finally, after walking a distance of one kilometer, he turns to his left again. In which direction is he moving now?
(a) North (b) South
(c) East (d) West

21. A man is facing south. He turns 135º in the anti clockwise direction and then 180º in the clockwise direction. Which direction is he facing now?
(a) North-east (b) North-west
(c) South-east (d) South-west

22. A man is facing north-west. He turns 90º in the clockwise direction and then 135º in anti clockwise direction. Which direction is he facing now?
(a) East (b) West
(c) North (d) South

23. A man is facing towards west and turns through 45º clockwise, again 180º clockwise and then turns through 270º anti clockwise. In which direction is he facing now?
(a) West (b) North-east
(c) South (d) South-west

24. A river flows west to east and on the way turns left and goes in a semi-circle round a hillock, and then turns left at right angles. In which direction is the river finally flowing?
(a) West (b) East
(c) North (d) Sourh

25. I am Standing at the centre of a circular field. I go down south to the edge of the field and then turning left I walk along the boundary of the field equal to three-eights of its length. Then I turn left by 45° and go right across to the opposite point to the boundary. In which direction am I from the starting point?
(a) North-west (b) North
(c) South-west (d) West

26. I am facing east. I turn 100º in the clockwise direction and then 145º in the anti clockwise direction. Which direction am I facing now?
(a) East (b) North-east
(c) North (d) South-west

27. A rat runs 20´ towards East and turns to right, runs 10´ and turns to right, runs 9´ and again turns to left, runs 5´ and then turns to left, runs 12´ and finally turns to left and runs 6´. Now, which direction is the rat facing?
(a) East (b) West
(c) North (d) South

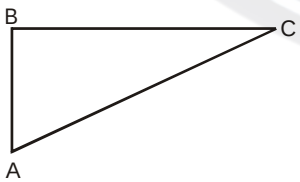
28. Maya starts at point T, walks straight towards North to point U which is 4 ft away. She truns left at 90º and walks 1 ft to Q, turns left at 90º and goes to V, who is 1 ft away and once again turns 90º right and goes to R, 3 ft away. What is the distance between T and R?
(a) 4 ft (b) 5 ft
(c) 7 ft (d) 8 ft

29. A villager went to meet his uncle in another village situated 5 km away in the North-east direction of his own village. From there he came to meet his father-in-law living in a village situated 4 km in the south of his uncle's village. How far away and in what direction is he now?
(a) 3 km in the North (b) 3 km in the East
(c) 4 km in the East (d) 4 km in the West

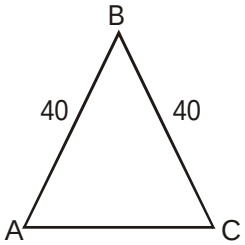
30. Aditya walked 15 m. towards south took a right turn and walked 3 m. He took a right turn again and walked 15 m before stopping. Which direction did he face.
(a) East (b) West
(c) North (d) South

Practice Set Solutions

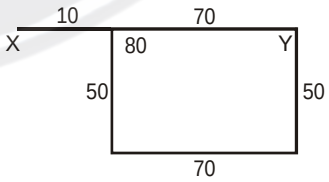
1. (d);



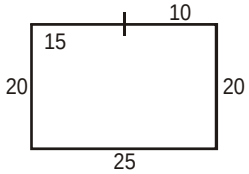
2. (a);



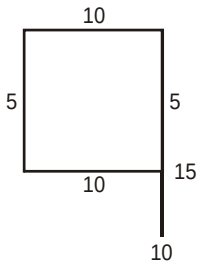
3. (a);



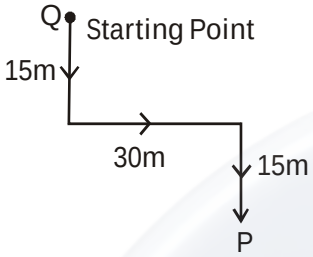
4. (b); 10 km



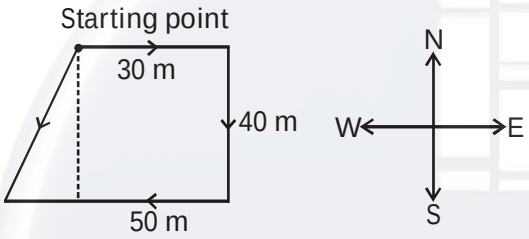
5. (c);



6. (b); Obviously, Z is facing south

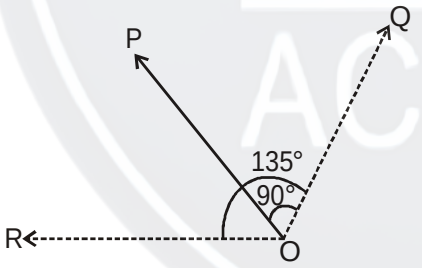


7. (c);

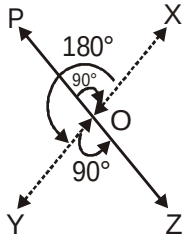


Clearly, Alok is in South-West direction from starting point.

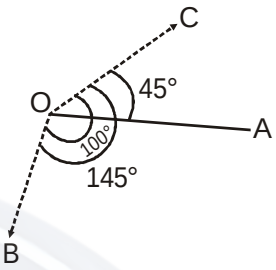
8. (b); As shown in Fig. the man initially faces in the direction OP. On moving 90° clockwise the man faces in the direction OQ. On further moving 135° anticlockwise, he faces in the direction OR, which is West.



9. (d); As shown in Fig. the man intially faces in the direction OP. On moving 90° clockwise, he faces in the direction OX. On further moving 180° anticlockwise, he faces in the direction OY. Finmally, on moving 90° anticlockwise, he faces in the direction OZ, which is South-east.



10. (b); As shown in Fig. the man initially faces towards eact i.e., in the firection OA. On moving 100° clockwise he faces in the directin OB. On further moving 145°clockwise, he faces in the dirction OC, Claearely, OC makes an angle of (145°–100°) i.e. 45° with OA and as such points in the direction North-east.



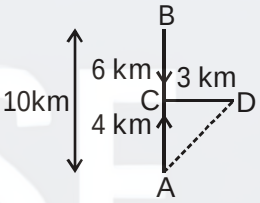
11. (b); The movements of Kishankant are as shown in Fig. (A to B, B to C and C to D).

AC = (AB-BC) =(10–6) km = 4 km

Kishankant's distance from startimg point A

$= AD = \sqrt{AC^2 + CD^2} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$ km

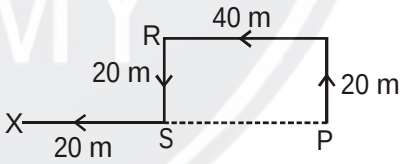
So Kishankant is 5 km to the North-east of his starting point.



12. (d); The movements of Gaurav are as shown in Fig. Clearly, Gaurav's distance from his initial position

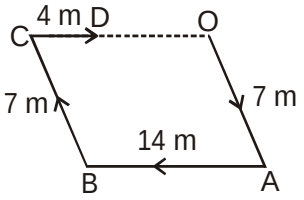
P = PX = (PS + SX)

= (QR + SX) = (40 + 20)m = 60.



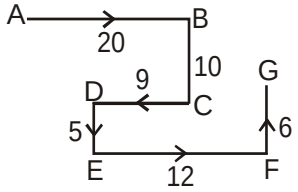
13. (c); The movements of Radha are as shown in Fig. Clearly, Radha's distance from the staring point

O = OD = (OC–CD) = (AB–CD) = (14–4) m = 10 m

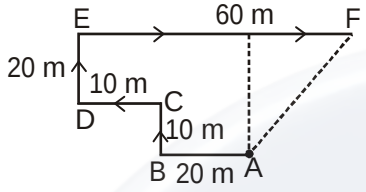


14. (c); The movements of the rat from A to G are as shown in Fig.

Clearly, it is finally walking in the direction FG, ie North.



15. (d); The movements of the person are form A to F, as shown in Fig. Clearly, the final position is F which is to the North-east of the starting point A

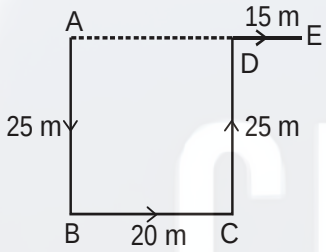


16. (a); The movements of Rohit are as shown in fig.

∴ Rohit's distance from starting point A =

AE = AD + DE = BC + DE = (20 + 15)m = 35 m

Also, E is to the East of A



17. (c); The movements of Sachin are as shown in Fig.

(P to B, B to C, C to D and D to Q)

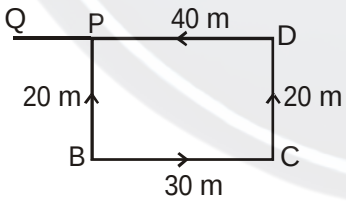
Clearly, distance of Q from P

= PQ = (DQ - PD) = (DQ - BC)

= (40 - 30) m = 10 m

Also, Q is to the West of P.

∴ Q is 10 m West of P.



18. (c); The movements of the man are as shown in Fig.

(A to B, B to C, C to D and D to E)

Clearly, DF = BC = 5 km

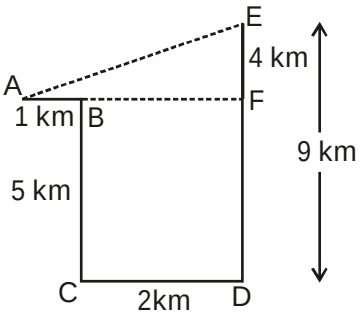
EF= (DE- DF) = (9-5) km = 4 km

BF = CD = 2 km

AF = AB + BF = AB + CD = (1 + 2) km = 3 km

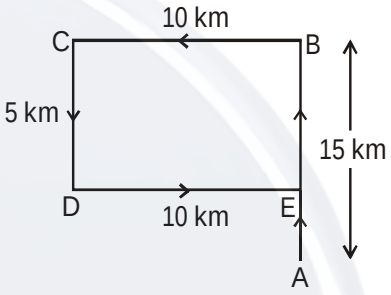
∴ Man's distance from starting point A = AE

$= \sqrt{AF^2 + EF^2} = \sqrt{3^2 + 4^2} = \sqrt{25} = 5\,km$

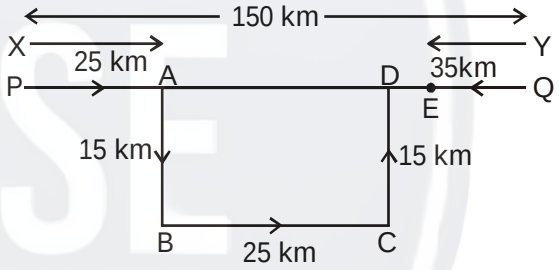


19. (c); The movements of Lokesh are as shown in Fig. (A to B, B to C, C to D and D to E).

Clearly, his final position is E which is to the North of his house at A.



20. (a); Let X and Y be two buses.



Bus X travels along the path PA, AB, BC, CD.

Now, AD = BC =25 km

So, PD = PA + AD = 50 km

Bus Y travels 35 km upto E

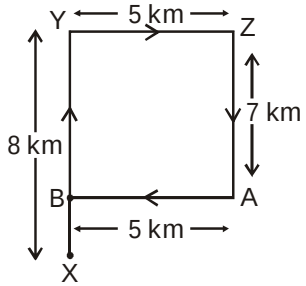
∴ Distance between two buses = PQ - (PD + QE)

= {150 - (50+35)} = 65 km

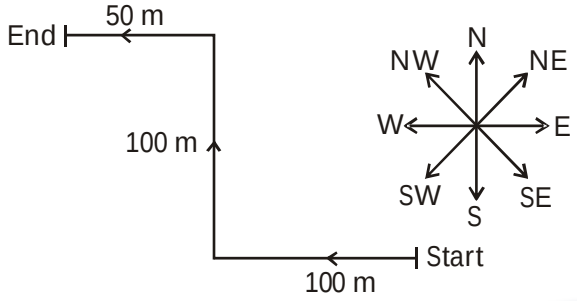
21. (a); Clearly, the route of Sohan is as shown in the diagram given below :

Here, XB = XY – YB = XY – AZ (∴ YB = AZ)

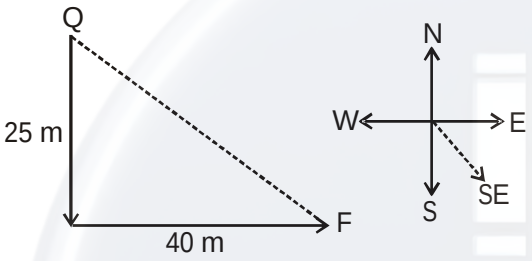
= 8 km – 7 km = 1 km



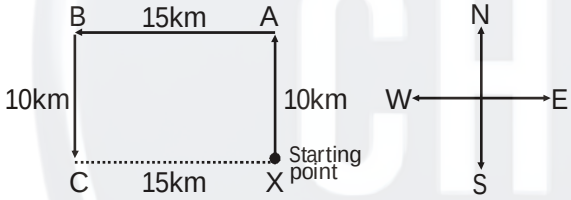
22. (d); From the figure given below, Raj is finally in the North-West direction from the starting point.



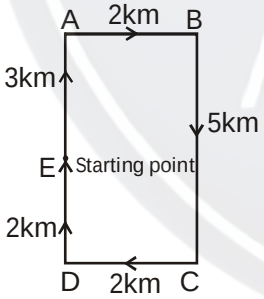
23. (d); From the figure, it is clear that Alok is in the South-East direction with reference to starting point Q.



24. (d);

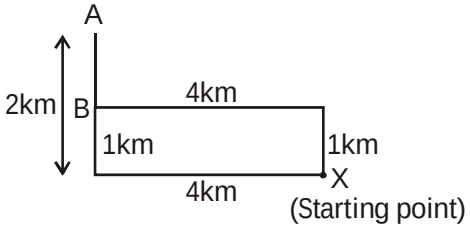


25. (a);



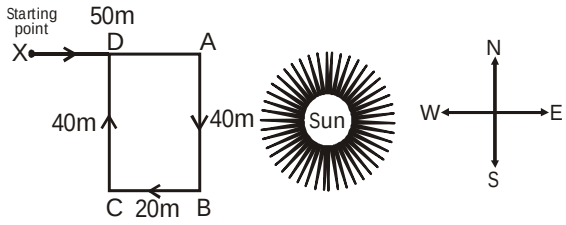
Finally he is facing North direction.

26. (a);



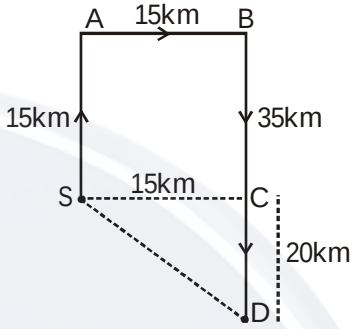
Clearly the distance between A and B = 1km

27. (b);



XD = XA – AD = 50 – 20 = 30m

28. (b);

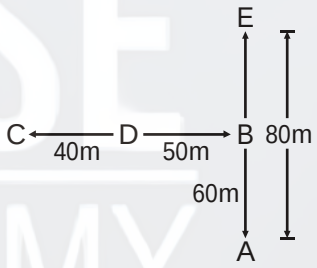


Let his starting point is S.
AB = SC =15 m, BC = AS = 15km
BD - BC = 35 - 15 = 20 km

$SD = \sqrt{SC^2 + CD^2} = \sqrt{15^2 + 20^2}$

$= \sqrt{225 + 400} = \sqrt{625} = 25\text{km}$

(29 – 31):



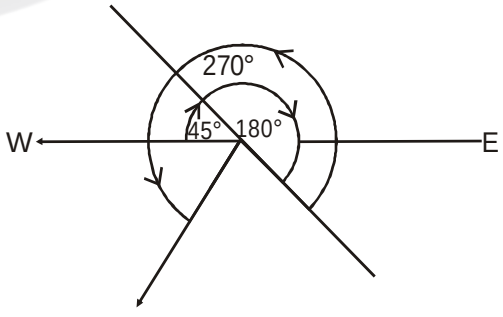
29. (d); Total distance walked by the boy.
= 40 + 50 + 60 + 80 = 230 m

30. (c); $CE = \sqrt{BC^2 + BE^2} = \sqrt{90^2 + 20^2}$

$= \sqrt{8100 + 400} = \sqrt{8500} = 92.19\text{m}$

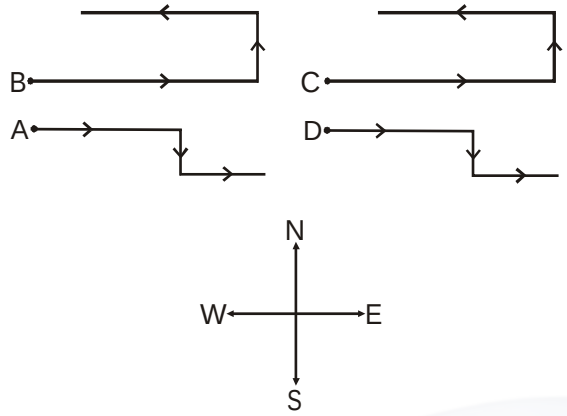
31. (a);

32. (d);

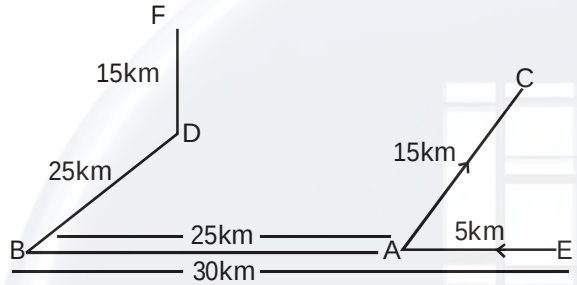


So, finally he is facing South-West direction.

33. (a);



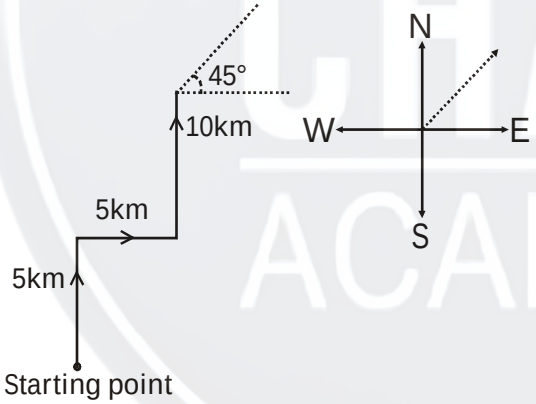
34. (a); The diagram of check post according to direction.



EF = BE + BD + DF = 30 + 25 +15 = 70km

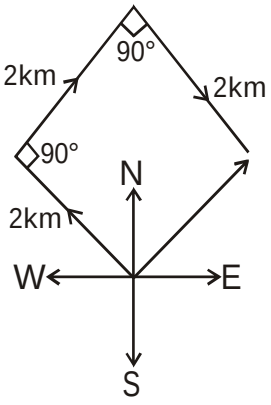
35. (b); B is located to south-west of D.

36. (c);

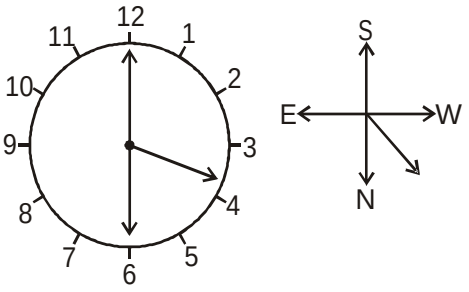


Finally Vishesh is facing North-East direction

37. (b);

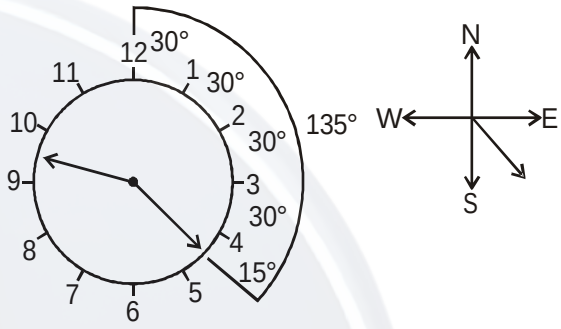


38. (a);



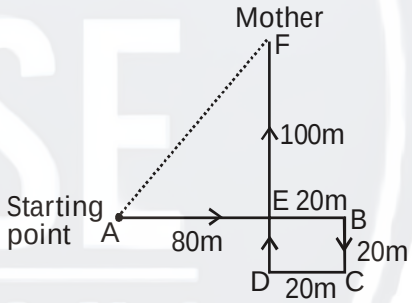
Obviously, an hour hand points towards North-West.

39. (a);



S.E. & Time 9 : 22:5

40. (c);



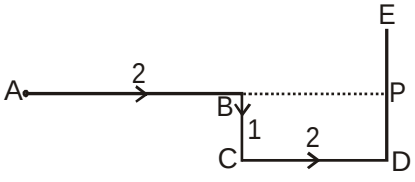
AE = AB - EB
= 80 – 20 = 60m
EF = DF - DE
= 100 - 20 = 80m
Now in Δ AEF,

$AF = \sqrt{(AE)^2 + (EF)^2}$

$= \sqrt{60^2 + 80^2}$

$= \sqrt{3600 + 6400} = \sqrt{10000} = 100\text{m}$

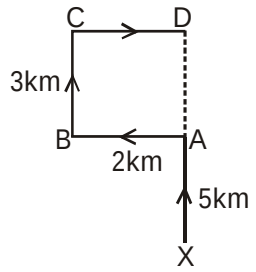
41. (c);



AP = 2 + 2 = 4 km
PE = 4 – 1 = 3km

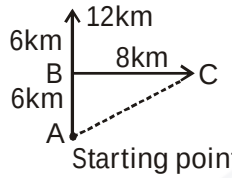
$\Rightarrow$ AE = $\sqrt{16+9} = 5\text{km}$

42. (b);



XD = XA + AD = 5 + 3 = 8 km

43. (c);

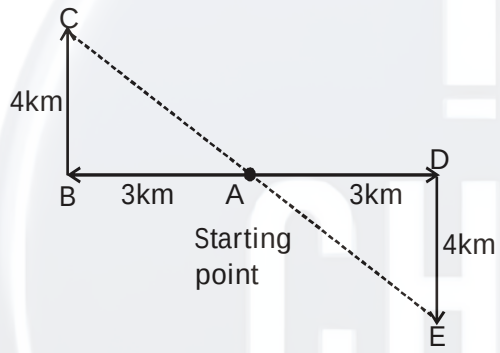


$AC = \sqrt{(AB)^2 + (BC)^2} = \sqrt{(6)^2 + (8)^2}$

$= \sqrt{36+64} = \sqrt{100} = 10\text{km}$

and the direction is North-East

44. (d);



In Δ ABC, $AC = \sqrt{(AB)^2 + (BC)^2}$

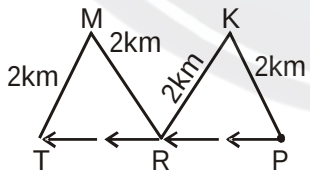
$= \sqrt{(3)^2 + (4)^2} = \sqrt{9+16} = \sqrt{25} = 5\text{km}$

In Δ ADE, $AE = \sqrt{(AD)^2 + (DE)^2}$

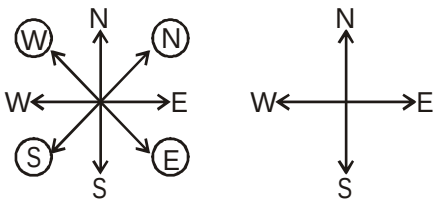
$= \sqrt{(3)^2 + (4)^2} = \sqrt{9+16} = \sqrt{25} = 5\text{km}$

Hence, CE = 5 + 5 = 10km

45. (b); West

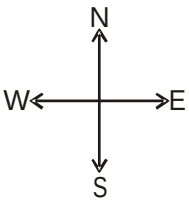


46. (a); According to question

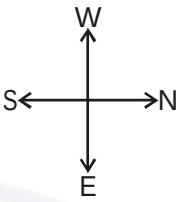


Now North direction is West-North or North-West.

47. (a);

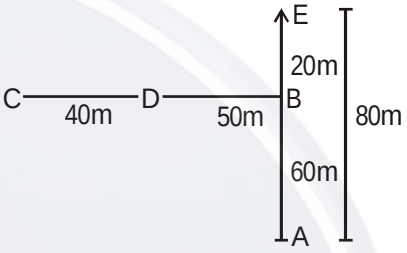


changed direction



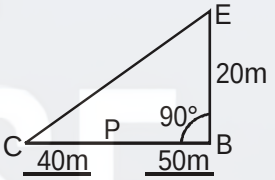
Oviously, he is going in West direction.

48. (d);



Required distance = 40 + 50 + 60 + 80 = 230 m

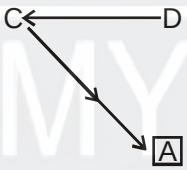
49. (c);



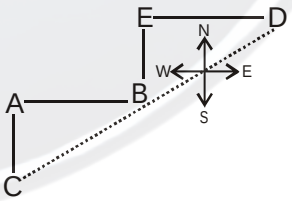
$EC = \sqrt{(CB)^2 + (BE)^2} = \sqrt{(90)^2 + (20)^2}$

$= \sqrt{8100+400} = \sqrt{8500} = 92\text{m}$ (near about)

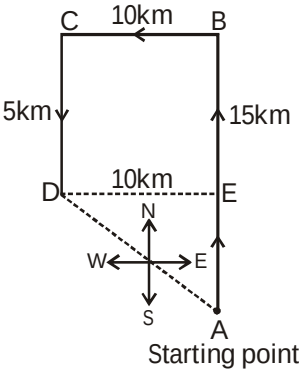
50. (a);



51. (c);



52. (d);



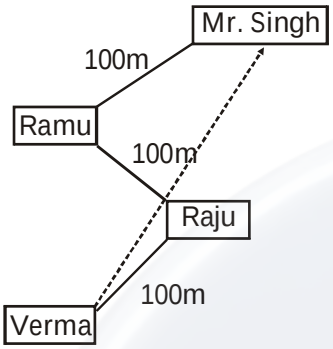
DE = CB =10km
AE = AB - BE = 15 – 5 = 10km
(CD = BE)

AD = $\sqrt{DE^2 + AE^2} = \sqrt{(10)^2 + (10)^2}$

$= \sqrt{100+100} = \sqrt{200} = \sqrt{100 \times 2} = 10\sqrt{2}$

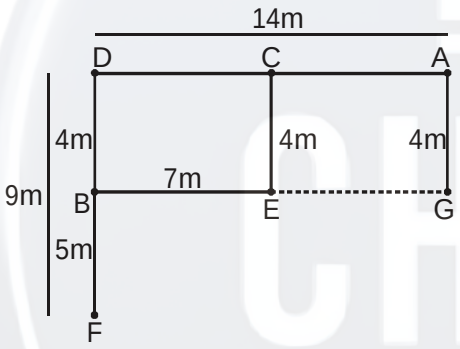
Thus it's $10\sqrt{2}$ km in North-West direction.

53. (b);



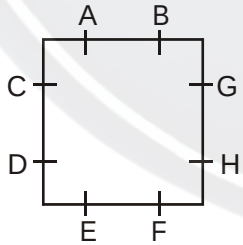
Mr. Singh is in North-East direction from Verma.

(54 – 56):



54. (d); From given option E,B, G are in a straight line
55. (a); 'A' is in the East of 'C'.
56. (c); Surely, he will reach at point 'E' first.

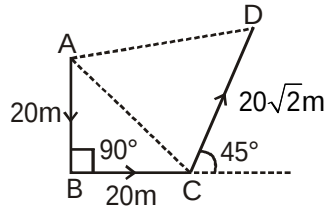
(57 – 60):



57. (b); 58. (c); 59. (a); 60. (d);

Distinct Solutions

61. (c);



Here, AC = $\sqrt{20^2 + 20^2} = 20\sqrt{2}$ m

Since AB = BC

∴ ∠ACB = ∠BAC = 45°

∴ ∠ACD = 90°

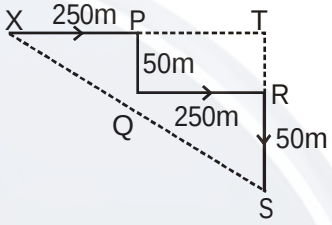
Now,

$AD^2 = AC^2 + CD^2 = \left(20\sqrt{2}\right)^2 + \left(20\sqrt{2}\right)^2$

= 800 + 800 = 1600

∴ AD = $\sqrt{1600}$ =40 m

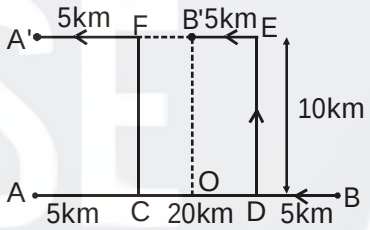
62. (a);



XS = $\sqrt{XT^2 + TS^2} = \sqrt{500^2 + 100^2}$

= $\sqrt{250000 + 10000} = 509.9$ metres.

63. (a);



The above fig. shows the movements of A and B.

We have to find A'B'

A'B' = A'F+FB'

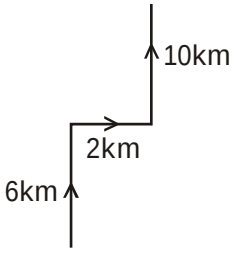
FB' = AB – (AC + BD + OD)

= [20 –(5 + 5 + 5) =] 5km

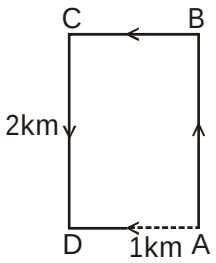
∴ A'B' = [5 + 5] = 10 km

[∵ A'F = 5 km, from the fig.]

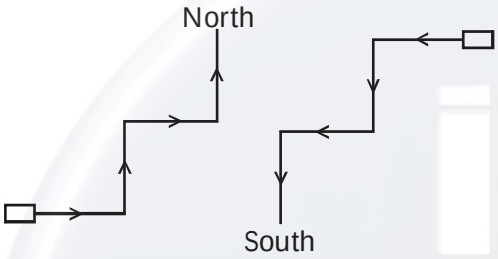
64. (b); Clearly, the route is as shown in the diagram. Thus, the man started his journey from the South and moved northwards.



65. (b); Clearly, the boy ride from A to B, then to C and finally upto D Since D lies to the west of A, so requied distance = AB = CD = 2 km.

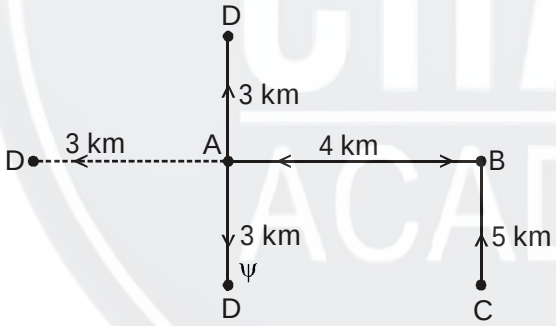


66. (a); Clearly, there are two possible movement of Anuj as shown below :

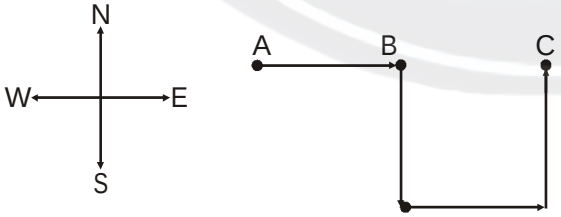


Thus, Anuj is finally moving towards either North or South.

67. (a); Clearly, mountaineer is [(12- (4 + 5) =]3 km away from the point A

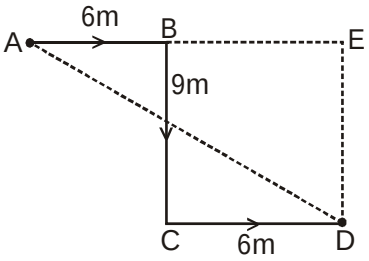


68. (b); Movements of Sunil are as shown in figure.



Hence, AC = AB + BC = 2AB

69. (a); Movements of Shyam are as shown in the figure given below:



A = Starting point

D = End point

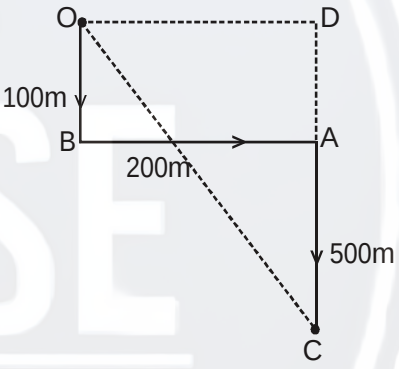
$AD = \sqrt{AE^2 + ED^2}$; Here AE = AB + BE (=CD)

= (6 + 6) = 12m

& ED = BC = 9 m

$\therefore$ $AD = \sqrt{12^2 + 9^2} = \sqrt{144 + 81} = \sqrt{225} = 15m$

70. (c); Ravi starts from O and finished at C.



$OC = \sqrt{OD^2 + CD^2} = \sqrt{OD^2 + (DA + AC)^2}$

$= \sqrt{(200)^2 + (100 + 500)^2}\ m$

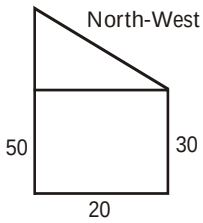
$= \sqrt{200 \times 200 + 600 \times 600}\ m$

$= 100\sqrt{4 + 36}\ m = 100\sqrt{40} m = 200\sqrt{10} m$

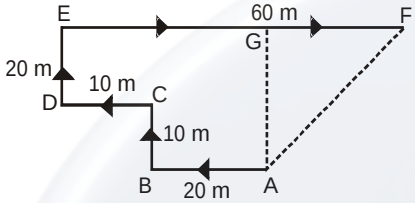
[$\because$ OD = AB = 200 m ; DA = OB = 100 m and AC = 500 m]

Previous Year Solutions

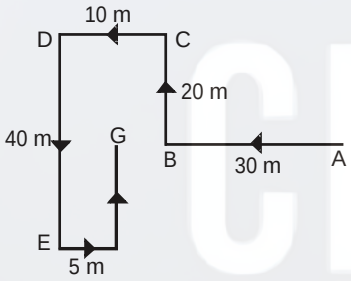
1. (a);



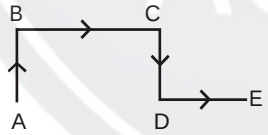
2. (d); The movements of the person are from A to F, as shown in figure. Clearly, the final position is F which is to the North-east of the starting point.



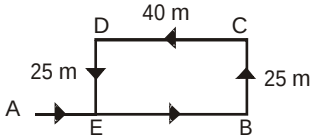
3. (a); The movements of Aditya are shown in figure from A to G. Clearly, Gopal is finally walking in the direction FG i.e., North.



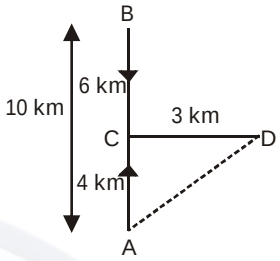
4. (c); The movements indicated are as shown in figure. Thus, the final movements in the direction indicated by DE, which is east.



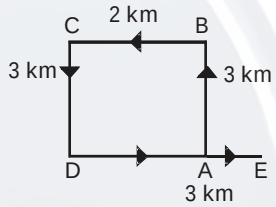
5. (d); The movements is shown in figure— Clearly, EB = DC = 40 m.
So, distance from the starting point A = (AB – EB) = (75 – 40) m = 35 m.



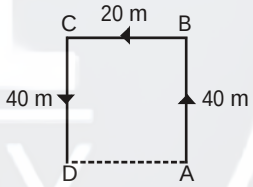
6. (b); The movements is as shown in figure.
AC = (AB – BC) = (10 – 6) km = 4 km. Clearly, D is to the North-east of A.
So, Kunal's distance from starting point A = AD = $\sqrt{AC^2 + CD^2} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$ km. So, it is 5 km to the North-east of his starting point



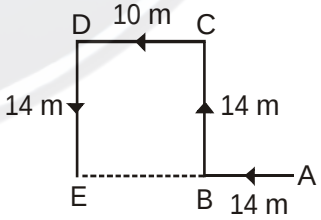
7. (a); The movements of Rohan are as shown in figure (A to B, B to C, C to D and D to E). Clearly, AD = BC = 2 km
So, required distance = AE = (DE – AD) = (3 – 2) = 1 km.



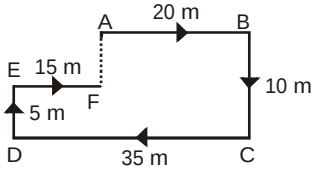
8. (d); The movements of Manick are as shown in figure (A to B, B to C and C to D). Clearly, ABCD is a rectangle and so AD = BC = 20 m. Thus, D is 20 m to the west of A.



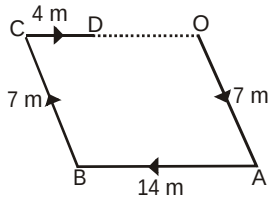
9. (b); The movements of Namita are shown in figure (A to B, B to C, C to D and D to E). Clearly, Namita's distance from his initial position = AE = (AB + BE) = (AB + CD) = (14 + 10) m = 24 m.



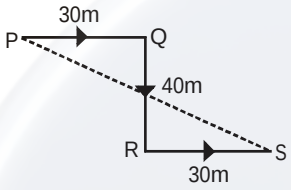
10. (b); Clearly, DC = AB + FE. So, F is in the line with A. Also, AF = (BC – DE) = 5 m. So, the man is 5 metres away from his initial position.



11. (c); The movements of Radha are as shown in figure. Clearly, Radha's distance from the starting point O = OD = (OC – CD) = (AB – CD) = (14 – 4) m = 10 m.



12. (c); The movements of Amit are shown in figure (P to Q, Q to R and R to S). Clearly, his final position is S which is to the South-east of the starting point P.



13. (b); The movements of the person are as shown in figure.

Clearly, AB = 3 km; BC = 3AB = (3 × 3) km = 9 km; CD = 5 AB = (5 × 3) km = 15 km.

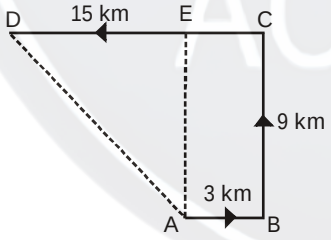
Draw AE ∥ CD. Then, CE = AB = 3 km and AE = BC = 9 km.

DE = (CD – CE) = (15 – 3) km = 12 km. In "AED,

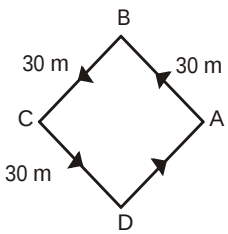
$AD^2 = AE^2 + DE^2$; AD = $\sqrt{9^2 + 12^2}$

= $\sqrt{225}$ = 15 km. So, required distance

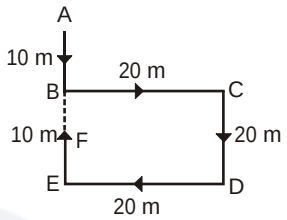
= AD = 15 km.



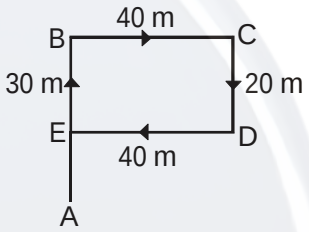
14. (a); The movements of the girl are as shown in figure (A to B, B to C, C to D, D to A). Clearly, she is finally moving in the direction DA i.e., North-east.



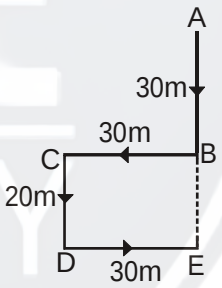
15. (b); The movements of Sanjeev from A to F are shown in figure. Clearly, Sanjeev's distance from starting point A = AF = (AB + BF) = AB + (BE – EF) = AB + (CD – EF) = [10 + (20 – 10)] m = (10 + 10) m = 20 m. Also, F lies to the South of A. So, Sanjeev is 20 metres to the south of his starting point.



16. (b); The movements of Kashish are as shown in figure (A to B, B to C, C to D, D to E). So, Kashish's distance from his original position A = AE = (AB – BE) = (AB – CD) = (30 – 20) m = 10 m.

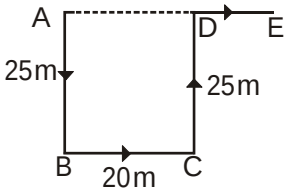


17. (d); The movements of the man are as shown in figure. So, Man's distance from initial position A = AE = (AB + BE) = (AB + CD) = (30 + 20) m = 50 m.



18. (a); The movements of Rohit are as shown in the figure.

So, Rohit's distance from starting point A = AE = (AD + DE) = (BC + DE) = (20 + 15) m = 35 m. Also, E is to the East of A.



19. (c); The movements of Sachin are as shown in figure (P to B, B to C, C to D and D to Q). Clearly, distance of Q from P = PQ = (DQ – PD) = (DQ – BC) = (40 – 30) m = 10 m. Also, Q is to the West of P. So, Q is 10 m West of P.