Reasoning

Direction & Distance

Level-3

Q1 Study the following information carefully and answer the questions accordingly.

Starting from point A, Abhi and Lokesh both traveled 4km east to reach point B. From there, Abhi took a right turn and Lokesh took a left turn. Abhi continued traveling 4km, made another right turn, traveled 2km, then made a third right turn, traveled 2km more, and finally made a left turn to travel 2km and reach his final destination Z. Meanwhile, Lokesh took a left turn from point B and traveled 2km, then made another left turn and traveled 1km, took a right turn and traveled 1km to reach point E. From there, he took another left turn and traveled 3km to reach point F. He then took a left turn, traveled 1km and took a final right turn to reach his final destination H, which was 3km ahead.

What is the shortest distance between Z and H?

(A) 4km (B) 5km
(C) 3km (D) 4.3km
(E) None of these

Q2 Directions : Study the following information carefully and answer the below questions

A@B(13m) A is 18m north of B
A#B(11m) A is 9m south of B
A$B(22m) A is 19m east of B
A%B(9m) A is 16m west of B
G@Q(19); P$G(15); T#R(13); F$L@Q; Q%T(8); F%R(2); F#M(11); P@S@E; S$M; F%E%R;
What is the direction of R with respect to Q?

(A) North-west
(B) South-east
(C) Can't be determined
(D) South-west
(E) North-East

Q3 Directions : Study the following information carefully and answer the below questions

A@B(13m) A is 18m north of B
A#B(11m) A is 9m south of B
A$B(22m) A is 19m east of B
A%B(9m) A is 16m west of B
G@Q(19); P$G(15); T#R(13); F$L@Q; Q%T(8); F%R(2); F#M(11); P@S@E; S$M; F%E%R;
What is the shortest distance between P and E?

(A) 13m (B) 21m
(C) 20m (D) 14m
(E) 11m

Q4 Six people A, B, C, D, E and F are standing in a certain direction from each other. Their arrangement is given in a coded form.
P 1 Q means P is to the north of Q.
P 2 Q means P is to the south of Q.
P 3 Q means P is to the east of Q.
P 4 Q means P is to the west of Q.
F 3 A 1 D 4 B; E 3 F 2 C 1 B
B is standing to the _____ of C.

(A) South (B) South-east
(C) North (D) North-west
(E) None of these

Q5 Six people A, B, C, D, E and F are standing in a certain direction from each other. Their arrangement is given in a coded form.
P 1 Q means P is to the north of Q.
P 2 Q means P is to the south of Q.
P 3 Q means P is to the east of Q.
P 4 Q means P is to the west of Q.
F 3 A 1 D 4 B; E 3 F 2 C 1 B
Who among the following are standing along the same horizontal line?

I. A
II. C
III. E
(A) Both I and II
(B) Both II and III
(C) Both I and III
(D) Only II
(E) None of these

Q6 Six people A, B, C, D, E and F are standing in a certain direction from each other. Their arrangement is given in a coded form.
P 1 Q means P is to the north of Q.
P 2 Q means P is to the south of Q.
P 3 Q means P is to the east of Q.
P 4 Q means P is to the west of Q.
F 3 A 1 D 4 B; E 3 F 2 C 1 B
Who is standing to the north-east of B ?
(A) A (B) C
(C) B (D) E
(E) None of these

Q7 Answer the following question based on the information given below.

In a certain code language,
P @ Q [x] means P is x (metres) east of Q.
P # Q [x] means P is x (metres) west of Q.
P ® Q [x] means Q is x (metres) north of P.
P © Q [x] means P is x (metres) south of Q.

If "W @ Z [13], X ® U [15], T © R [8], W ® S [7], V @ T [6], R # X [17], U @ S [9], Y ® V [10]",

What is the direction of S with respect to Y?
(A) North-east (B) South
(C) North-west (D) South-east
(E) North

Q8 Directions: Answer the following question based on the information given below.
In a certain code language,
P @ Q [x] means P is x (metres) east of Q.
P # Q [x] means P is x (metres) west of Q.
P ® Q [x] means Q is x (metres) north of P.
P © Q [x] means P is x (metres) south of Q.
If "W @ Z [13], X ® U [15], T © R [8], W ® S [7], V @ T [6], R # X [17], U @ S [9], Y ® V [10]",
What is the direction of X with respect to Z?
(A) South-east (B) South-west
(C) North-east (D) North-west
(E) None of these

Q9 Answer the following question based on the information given below.

In a certain code language,
P @ Q [x] means P is x (metres) east of Q.
P # Q [x] means P is x (metres) west of Q.
P ® Q [x] means Q is x (metres) north of P.
P © Q [x] means P is x (metres) south of Q.
If "W @ Z [13], X ® U [15], T © R [8], W ® S [7], V @ T [6], R # X [17], U @ S [9], Y ® V [10]",

What is the shortest distance between point R and point V?
(A) 10m (B) 12m
(C) 14m (D) 8m
(E) None of these

Q10 Answer the questions based on the information given below.

In a certain coded language,
If A # C (9m) means A is 9m west of C,
A @ C (7m) means A is 7m north of C,
A % C (11m) means A is 11m east of C,
A $ C (15m) means A is 15m south of C.
P @ S (8m), U % P (5m), V $ U (12m), Q # V (3m), W % Q (8m), Y @ Q (4m), W $ X (4m)

What is the shortest distance between S and X?
(A) 8m (B) 9m
(C) 10m (D) 12m
(E) 5m

Q11 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

1. A!5B means B is 5m to the east of A
2. A@4B means B is 4m to the west of A
3. A#3B means B is 3m to the north of A
4. A$9B means B is 9m to the south of A

Note : (1) #! means north-east
(2) #@ means north-west
(3) $! means south-east
(4) $@ means south-west
For example : F#@8A means A is 8m to the north-west of F.
Expression : P!11X#16S@3T!12Y; T#O@4J#!5Q$!13Y

Calculate the distance of QYSXP?
(A) 42m (B) 43m
(C) 47m (D) 49m
(E) 50m

Q12 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

1. A!5B means B is 5m to the east of A
2. A@4B means B is 4m to the west of A
3. A#3B means B is 3m to the north of A
4. A$9B means B is 9m to the south of A

Note : (1) #! means north-east
(2) #@ means north-west
(3) $! means south-east
(4) $@ means south-west
For example : F#@8A means A is 8m to the north-west of F.
Expression : P!11X#16S@3T!12Y; T#O@4J#!5Q$!13Y

Find the odd one out?
(A) PS (B) JQ
(C) XY (D) PT
(E) OS

Q13 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

1. A!5B means B is 5m to the east of A
2. A@4B means B is 4m to the west of A
3. A#3B means B is 3m to the north of A
4. A$9B means B is 9m to the south of A

Note : (1) #! means north-east
(2) #@ means north-west
(3) $! means south-east
(4) $@ means south-west
For example : F#@8A means A is 8m to the north-west of F.
Expression : P!11X#16S@3T!12Y; T#O@4J#!5Q$!13Y

Which of the following is not to the south-east of J?
(A) P (B) Y
(C) T (D) X
(E) S

Q14 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

1. A!B means A is 3m to the east of B
2. A@B means A is 2m to the west of B
3. A#B means A is 4m to the north of B
4. A$B means A is 5m to the south of B

Expression : P#Q!R$N!T@S

Find the odd one out with respect to T?
(A) R (B) P
(C) Q (D) N

(E) None of these

Q15 **Study the following information carefully and answer the questions accordingly.**

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

1. A!B means A is 3m to the east of B
2. A@B means A is 2m to the west of B
3. A#B means A is 4m to the north of B
4. A$B means A is 5m to the south of B

Expression : P#Q!R$N!T@S

What is the distance between S and N?

(A) 5m (B) 4m
(C) 3m (D) 2m
(E) 1m

Q16 **Study the following information carefully and answer the questions accordingly.**

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

1. A!B means A is 3m to the east of B
2. A@B means A is 2m to the west of B
3. A#B means A is 4m to the north of B
4. A$B means A is 5m to the south of B

Expression : P#Q!R$N!T@S

Which of the following is to the south-west of P?

(A) N (B) S
(C) T (D) R
(E) Q

Q17 **Study the following information carefully and answer the questions accordingly.**

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

A!4B means A is 8m to the east of B
A@7B means A is 14m to the west of B
A#5B means A is 10m to the north of B
A$2B means A is 4m to the south of B
Expression : G@2K#5T$7R!4W!3L#7Y

If J is the mid-point of W and R, then what is the distance between G and J?

(A) 2m (B) 6m
(C) 8m (D) 4m
(E) None of these

Q18 **Study the following information carefully and answer the questions accordingly.**

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

A!4B means A is 8m to the east of B
A@7B means A is 14m to the west of B
A#5B means A is 10m to the north of B
A$2B means A is 4m to the south of B
Expression : G@2K#5T$7R!4W!3L#7Y

Which of the following is not to the north-east of Y?

(A) R (B) G
(C) K (D) W
(E) L

Q19 **Study the following information carefully and answer the questions accordingly.**

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.

A!4B means A is 8m to the east of B
A@7B means A is 14m to the west of B
A#5B means A is 10m to the north of B
A$2B means A is 4m to the south of B
Expression : G@2K#5T$7R!4W!3L#7Y

Which of the following is to the west of T?

(A) Y (B) L

(C) W (D) R
(E) K

Q20 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.
P%5Q means P is 3m to the north of Q
P^6Q means P is 4m to the south of Q
P&4Q means P is 2m to the east of Q
P*7Q means P is 5m to the west of Q
Expression : F&7N*5T^3O*8G%7H

If L is 4m to the north of H, then which of the following is 9m to the west of L?
(A) F (B) T
(C) O (D) G
(E) N

Q21 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.
P%5Q means P is 3m to the north of Q
P^6Q means P is 4m to the south of Q
P&4Q means P is 2m to the east of Q
P*7Q means P is 5m to the west of Q
Expression : F&7N*5T^3O*8G%7H

Which of the following is 2m to the west of F?
(A) O (B) G
(C) T (D) N
(E) H

Q22 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.
P%5Q means P is 3m to the north of Q
P^6Q means P is 4m to the south of Q
P&4Q means P is 2m to the east of Q
P*7Q means P is 5m to the west of Q
Expression : F&7N*5T^3O*8G%7H

Which of the following is not to the north-west of H?
(A) N (B) T
(C) O (D) F
(E) G

Q23 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.
P%5Q means P is 5m to the north of Q
P^6Q means P is 6m to the south of Q
P&4Q means P is 4m to the east of Q
P*7Q means P is 7m to the west of Q
Note : (1) %& means north-east
(2) %* means north-west
(3) ^& means south-east
(4) ^* means south-west
For example : F%*8A means F is 8m to the north-west of A.
Expression : X%&5Y*4Z^10M%5K; N*7M^&25L; Y&3S

Calculate the distance of LMKXY?
(A) 35m (B) 36m
(C) 34m (D) 37m
(E) 33m

Q24 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.
P%5Q means P is 5m to the north of Q
P^6Q means P is 6m to the south of Q
P&4Q means P is 4m to the east of Q

P*7Q means P is 7m to the west of Q
Note : (1) %& means north-east
(2) %* means north-west
(3) ^& means south-east
(4) ^* means south-west
For example : F%*8A means F is 8m to the north-west of A.
Expression : X%&5Y*4Z^10M%5K; N*7M^&25L; Y&3S

Which of the following is not to the north-east of S?
(A) M (B) K
(C) X (D) L
(E) Z

Q25 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the expression given below.
P%5Q means P is 5m to the north of Q
P^6Q means P is 6m to the south of Q
P&4Q means P is 4m to the east of Q
P*7Q means P is 7m to the west of Q
Note : (1) %& means north-east
(2) %* means north-west
(3) ^& means south-east
(4) ^* means south-west
For example : F%*8A means F is 8m to the north-west of A.
Expression : X%&5Y*4Z^10M%5K; N*7M^&25L; Y&3S

Which of the following is not to the south-east of L?
(A) M (B) K
(C) X (D) Y
(E) N

Q26 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the question given below.
P#8Q means P is 10m to the north of Q
P$21Q means P is 19m to the south of Q
P!13Q means P is 12m to the east of Q
P@4Q means P is 4m to the west of Q
Ramesh was living #7 of Shyam. One day, Shyam went to Richa's house which was !9 of Piyush's home, but she was not there. She went out with Rekha who lived $3 of Atul's house. Divya lived @6 of Abha's house, who lived $15 of Richa's house. Piyush's house was !9 of Shyam's house. Atul's house was $7 of Divya's house.

What is the distance between Shyam's house and Richa's house?
(A) 9m (B) 12m
(C) 14m (D) 15m
(E) 16m

Q27 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the question given below.
P#8Q means P is 10m to the north of Q
P$21Q means P is 19m to the south of Q
P!13Q means P is 12m to the east of Q
P@4Q means P is 4m to the west of Q
Ramesh was living #7 of Shyam. One day, Shyam went to Richa's house which was !9 of Piyush's home, but she was not there. She went out with Rekha who lived $3 of Atul's house. Divya lived @6 of Abha's house, who lived $15 of Richa's house. Piyush's house was !9 of Shyam's house. Atul's house was $7 of Divya's house.

What is the longest distance between Ramesh's and Rekha's house?
(A) 46m (B) 47m
(C) 48m (D) 49m
(E) 50m

Q28 Study the following information carefully and answer the questions accordingly.

A set of coded directions is given below. You have to decode the meaning of the following symbols and solve the question given below.
P#8Q means P is 10m to the north of Q
P$21Q means P is 19m to the south of Q
P!13Q means P is 12m to the east of Q
P@4Q means P is 4m to the west of Q
Ramesh was living #7 of Shyam. One day, Shyam went to Richa's house which was !9 of Piyush's home, but she was not there. She went out with Rekha who lived $3 of Atul's house. Divya lived @6 of Abha's house, who lived $15 of Richa's house. Piyush's house was !9 of Shyam's house. Atul's house was $7 of Divya's house.

Who did not live to the south-east of Piyush?
(A) Ramesh (B) Divya
(C) Rekha (D) Abha
(E) Atul

Q29 Study the following information carefully and answer the questions given below. It has been given that-

Z 8 Y means Y is to the north of Z
Z ŧ Y means Y is to the south of Z.
Z ≠ Y means Z is to the east of Y.
Z ^ Y means Z is to the west of Y.

H is ŧ 20 m from point K. Point J is ŧ 15 m from point I. Point F is 8 15 m from Point E. Point G is ≠ 20 m from point E. Point F is ≠ 16 m from point J. Point I is ≠ 30 m From point K.

H is in which direction with respect to F?
(A) East (B) South-East
(C) North-East (D) South-West
(E) North-West

Q30 Study the following information carefully and answer the questions given below. It has been given that-

Z 8 Y means Y is to the north of Z
Z ŧ Y means Y is to the south of Z.
Z ≠ Y means Z is to the east of Y.
Z ^ Y means Z is to the west of Y.

H is ŧ 20 m from point K. Point J is ŧ 15 m from point I. Point F is 8 15 m from Point E. Point G is ≠ 20 m from point E. Point F is ≠ 16 m from point J. Point I is ≠ 30 m From point K.

What is the shortest distance between point F and G?
(A) 20m (B) 30m
(C) 15m (D) 25m
(E) None of these

Q31 Directions: Study the following questions carefully and answer the questions given below.
In a certain coded language,
'@' means east.
'#' means west.
'%' means north.
'$' means south.
Note: If two symbols are given simultaneously then we will consider both the directions.
For example,
%@ means north-east.
A kid accidently bumped into a directional sign board. He placed the board again but in such a way that the arrow which was first showing $@ is now showing %. Stephan went in a wrong way thinking it to be #. In which direction is Stephan actually travelling now?
(A) $@ (B) %@
(C) $# (D) %#
(E) None of these

Q32 Study the following information carefully and answer the questions accordingly.

1 $ 2 means 2 is at 2 m to the North of 1.

1 * 2 means 2 is at 2 m to the left of 1.
1 @ 2 means 2 is at 2 m to the south of 1.
1 # 2 means 2 is at 2 m to the right of 1.

Following given equation- ZA @ BA * PA, PA is in which direction of ZA?
(A) South (B) West
(C) South-West (D) North-West
(E) None of these

Q33 Study the following information carefully and answer the questions accordingly.

1 $ 2 means 2 is at 2 m to the North of 1.
1 * 2 means 2 is at 2 m to the left of 1.
1 @ 2 means 2 is at 2 m to the south of 1.
1 # 2 means 2 is at 2 m to the right of 1.

Following the equation- PB * RB $ AB # UB, in which direction is PB with respect to AB?
(A) West (B) South-East
(C) North-West (D) East
(E) None of these

Q34 Study the following information carefully and answer the questions given below:

In a certain code language,
S%Q (21m) means S is 21m north of Q.
S&Q (19m) means S is 19m south of Q.
S*Q (45m) means S is 45m east of Q.
S@Q (11m) means S is 11m west of Q.
If, C%F (12m); F@H (5m); I@D (4m); I&H(3m); A%D (8m) A@G (5m); E%A (7m); B*E (5m)

If J%H (5m), then what will be the distance between J and G?
(A) 7m (B) 5m
(C) 9m (D) 10m
(E) None of these

Q35 Study the following information carefully and answer the questions given below:

In a certain code language,
S%Q (21m) means S is 21m north of Q.
S&Q (19m) means S is 19m south of Q.
S*Q (45m) means S is 45m east of Q.
S@Q (11m) means S is 11m west of Q.
If, C%F (12m); F@H (5m); I@D (4m); I&H(3m); A%D (8m) A@G (5m); E%A (7m); B*E (5m)

If L is the midpoint of line CB, then what is the distance between L and E?
(A) 1m (B) 2m
(C) 3m (D) 4m
(E) None of these

Q36 Study the following information carefully and answer the questions given below:

In a certain code language,
S%Q (21m) means S is 21m north of Q.
S&Q (19m) means S is 19m south of Q.
S*Q (45m) means S is 45m east of Q.
S@Q (11m) means S is 11m west of Q.
If, C%F (12m); F@H (5m); I@D (4m); I&H(3m); A%D (8m) A@G (5m); E%A (7m); B*E (5m)

What is the direction of H with respect to B?
(A) South-west (B) North
(C) South-east (D) South
(E) None of these

Q37 Directions: Study the following data carefully and answer the questions accordingly.
1 # 2 - 1 is 4m east of 2
1 & 2 - 1 is either 10 or 15m west of 2
1 % 2 - 1 is either 6 or 14m north of 2
1 $ 2 - 1 is 12m south of 2
1 %# 2 – means 1 is north-east of 2
1 $& 2 – means 1 is south-west of 2
Q % Z, U # R, Q & R, S $ R, Z $& S
What is the distance between Z and Q then if the distance between Q and U is 19m?
(A) 22m (B) 17m
(C) 20m (D) 14m
(E) None of these

Q38

Directions: Study the following data carefully and answer the questions accordingly.

1 # 2 - 1 is 4m east of 2

1 & 2 - 1 is either 10 or 15m west of 2

1 % 2 - 1 is either 6 or 14m north of 2

1 $ 2 - 1 is 12m south of 2

1 %# 2 – means 1 is north-east of 2

1 $& 2 – means 1 is south-west of 2

U # R, Q & R, S $ R

What is the distance between U and Q if the shortest distance between Q and S is $2\sqrt{61}$m?

(A) 15m (B) 12m

(C) 19m (D) 14m

(E) None of these

Q39 **Directions: Study the following data carefully and answer the questions accordingly.**

1 # 2 - 1 is 4m east of 2

1 & 2 - 1 is either 10 or 15m west of 2

1 % 2 - 1 is either 6 or 14m north of 2

1 $ 2 - 1 is 12m south of 2

1 %# 2 – means 1 is north-east of 2

1 $& 2 – means 1 is south-west of 2

Z %# K, N # L, Z % N, K % L

If O $ N, then what is the distance between O and Z?

(A) 34m (B) 32m

(C) 19m (D) 26m

(E) None of these

Q40 **Directions:** Study the following data carefully and answer the questions accordingly.

1 # 2 - 1 is 4m east of 2

1 & 2 - 1 is either 10 or 15m west of 2

1 % 2 - 1 is either 6 or 14m north of 2

1 $ 2 - 1 is 12m south of 2

1 %# 2 – means 1 is north-east of 2

1 $& 2 – means 1 is south-west of 2

Z %# K, N # L, Z % N, K % L

What is the shortest distance between Z and K?

(A) 14m (B) $4\sqrt{5}$m

(C) 8m (D) $10\sqrt{5}$m

(E) None of these

Answer Key

Q1	(B)	Q21	(C)
Q2	(E)	Q22	(E)
Q3	(A)	Q23	(D)
Q4	(A)	Q24	(D)
Q5	(C)	Q25	(E)
Q6	(D)	Q26	(E)
Q7	(A)	Q27	(E)
Q8	(A)	Q28	(A)
Q9	(A)	Q29	(E)
Q10	(C)	Q30	(D)
Q11	(D)	Q31	(A)
Q12	(E)	Q32	(C)
Q13	(A)	Q33	(B)
Q14	(D)	Q34	(C)
Q15	(E)	Q35	(B)
Q16	(D)	Q36	(A)
Q17	(D)	Q37	(D)
Q18	(E)	Q38	(D)
Q19	(A)	Q39	(D)
Q20	(E)	Q40	(B)

Hints & Solutions

Q1 Text Solution:

In triangle ZHG

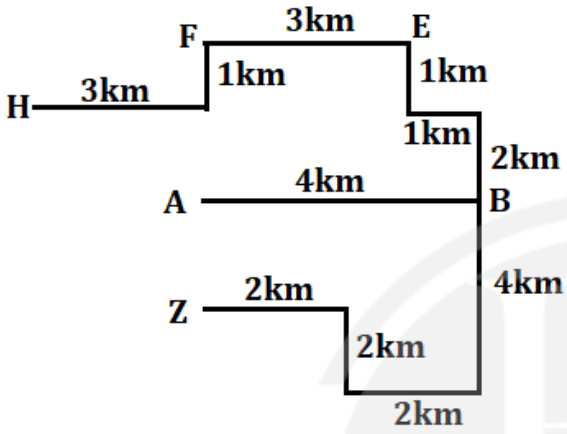
$ZH^2 = HG^2 + ZG^2$

$ZH^2 = 3^2 + 4^2$

$ZH^2 = 9 + 16$

$ZH^2 = 25$

$ZH = 5Km$



Q2 Text Solution:

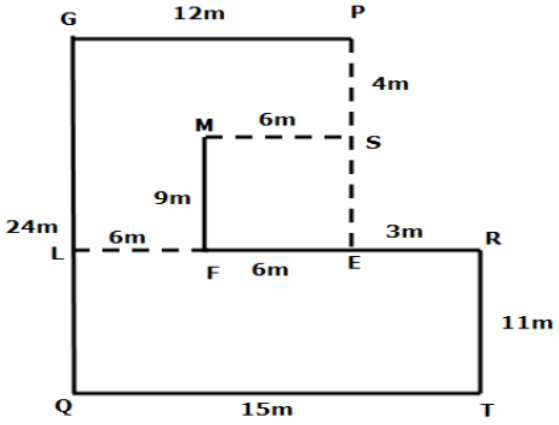
A@B(13m) A is 18m north of B13+5=18

A#B(11m) A is 9m south of B11-2=9

A$B(22m) A is 19m east of B22-3=19

A%B(9m) A is 16m west of B9+7=16

From the above condition, we have subtracted -2, -3 from the new sequence of questions and we have added 5, 7 to the new sequence of the question.



Q3 Text Solution:

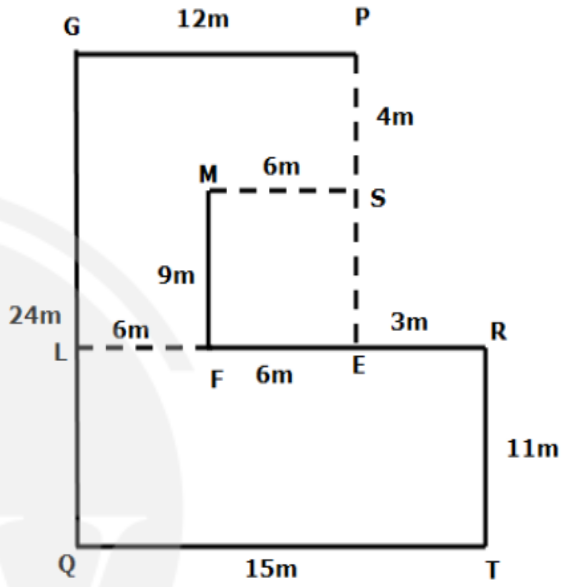
A@B(13m) A is 18m north of B13+5=18

A#B(11m) A is 9m south of B11-2=9

A$B(22m) A is 19m east of B22-3=19

A%B(9m) A is 16m west of B9+7=16

From the above condition, we have subtracted -2, -3 from the new sequence of questions and we have added 5, 7 to the new sequence of the question.



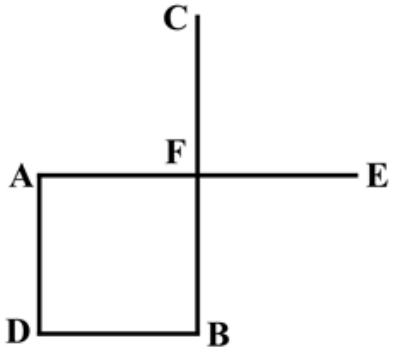
Q4 Text Solution:

Given expression: F 3 A 1 D 4 B; E 3 F 2 C 1 B

After decoding the codes we get,

F is to the east of A. A is to the north of D. D is to the west of B. E is to the east of F. F is to the south of C. C is to the north of B.

The final diagram:

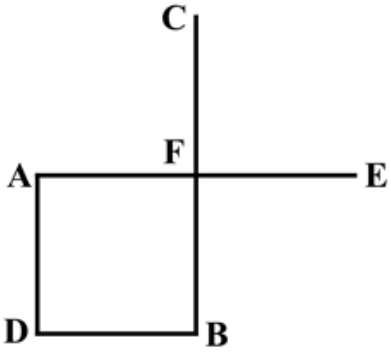


Hence, B is standing to the south of C.

Q5 Text Solution:

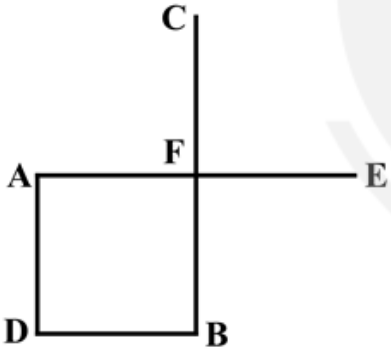
Given expression: F 3 A 1 D 4 B; E 3 F 2 C 1 B

After decoding the codes we get,
F is to the east of A. A is to the north of D. D is to the west of B. E is to the east of F. F is to the south of C. C is to the north of B.
The final diagram:



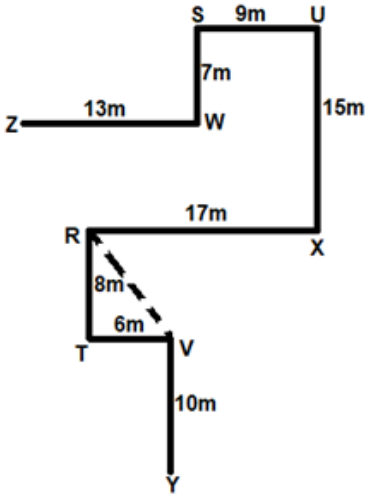
Hence, both A and E are standing along the same horizontal line.

Q6 Text Solution:
Given expression: F 3 A 1 D 4 B; E 3 F 2 C 1 B
After decoding the codes we get,
F is to the east of A. A is to the north of D. D is to the west of B. E is to the east of F. F is to the south of C. C is to the north of B.
The final diagram:



Hence, E is standing to the north-east of B.

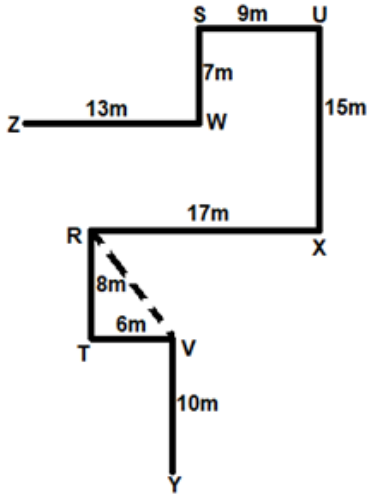
Q7 Text Solution:
Given expression: "W @ Z [13], X ® U [15], T © R [8], W ® S [7], V @ T [6], R # X [17], U @ S [9], Y ® V [10]"
After decoding the codes we get,
W @ Z [13] means W is the 13m east of Z, X ® U [15] means U is the 15m north of X, T © R [8] means T is the 8m south of R, W ® S [7] means S is the 7m north of W, V @ T [6] means V is the 6m east of T, R # X [17] means R is 17m west of X, U @ S [9] means U is 9m east of S, Y ® V [10] means V is 10m north of Y.
The final diagram:



Hence, S is in the north-east direction of Y.

Q8 Text Solution:
Given expression: "W @ Z [13], X ® U [15], T © R [8], W ® S [7], V @ T [6], R # X [17], U @ S [9], Y ® V [10]"

After decoding the codes we get,
W @ Z [13] means W is the 13m east of Z, X ® U [15] means U is the 15m north of X, T © R [8] means T is the 8m south of R, W ® S [7] means S is the 7m north of W, V @ T [6] means V is the 6m east of T, R # X [17] means R is 17m west of X, U @ S [9] means U is 9m east of S, Y ® V [10] means V is 10m north of Y.
The final diagram:



Hence, X is in the south-east direction of Z.

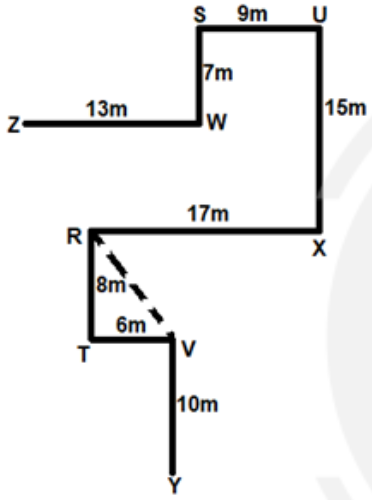
Q9 Text Solution:

Given expression: "W @ Z [13], X ® U [15], T © R [8], W ® S [7], V @ T [6], R # X [17], U @ S [9], Y ® V [10]"

After decoding the codes we get,

W @ Z [13] means W is the 13m east of Z, X ® U [15] means U is the 15m north of X, T © R [8] means T is the 8m south of R, W ® S [7] means S is the 7m north of W, V @ T [6] means V is the 6m east of T, R # X [17] means R is 17m west of X, U @ S [9] means U is 9m east of S, Y ® V [10] means V is 10m north of Y.

The final diagram:



Shortest distance between R and V can be determined by using Pythagoras theorem.

$RV = \sqrt{(8^2 + 6^2)}$ m

$RV = \sqrt{(64 + 36)}$ m

$RV = \sqrt{100}$ m

RV = 10m

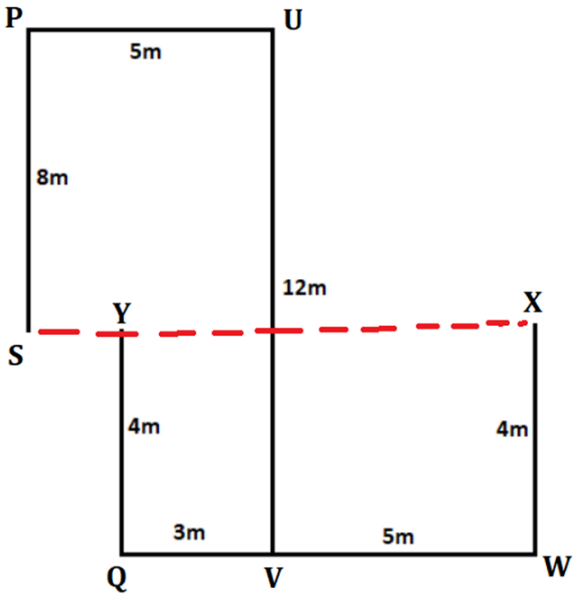
Hence, the shortest distance between R and V is 10m.

Q10 Text Solution:

On decoding the codes, we get:

P is 8m north of S. U is 5m east of P. V is 12m south of U. Q is 3m west of V. W is 8m east of Q. Y is 4m north of Q. W is 4m south of X.

We draw the following figure:



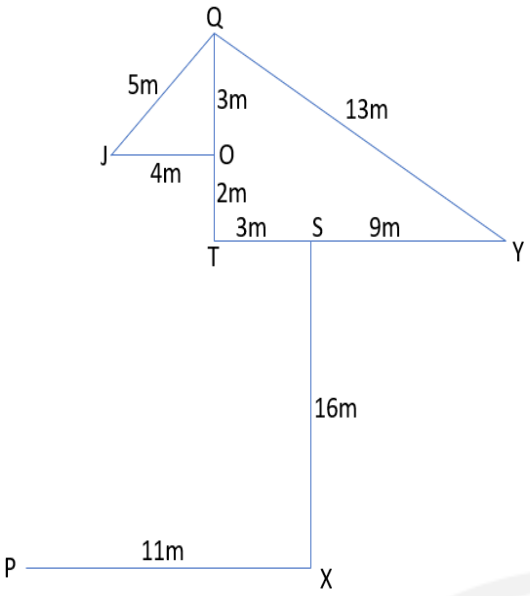
So, the shortest distance between S and X is 10m.

Hence, option c) is the correct answer.

Q11 Text Solution:

Code	Meaning
!	East
@	West
#	North
$	South
#!	North-east
#@	North-west
$!	South-east
$@	South-west

Expression : P!11X#16S@3T!12Y; T#O@4J#!5Q$!13Y

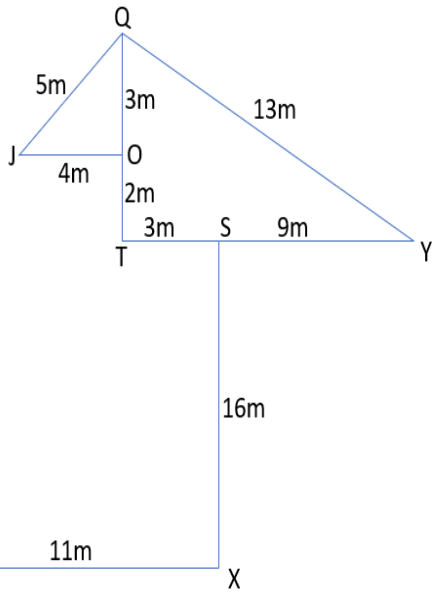


- **The distance of QYSXP = QY+YS+SX+XP = 13m+9m+16m+11m = 49m**

Q12 Text Solution:

Code	Meaning
!	East
@	West
#	North
$	South
#!	North-east
#@	North-west
$!	South-east
$@	South-west

Expression : P!11X#16S@3T!12Y; T#O@4J#!5Q$!13Y

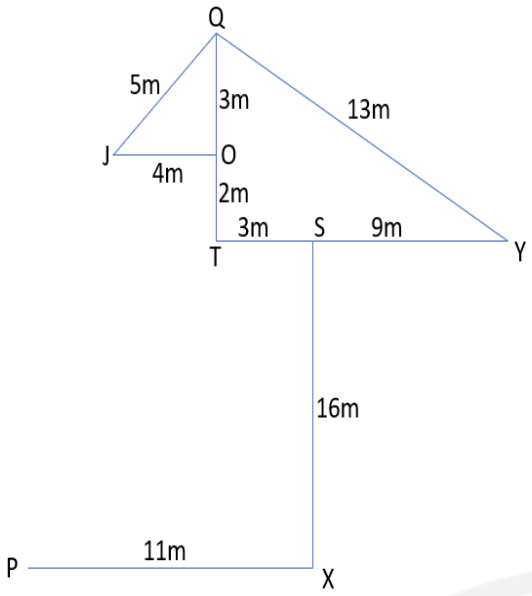


- **In the case of OS : The second letter from left is to the south-east of the first letter from left.**
- **But, in other cases, The second letter from left is to the north-east of the first letter from left.**

Q13 Text Solution:

Code	Meaning
!	East
@	West
#	North
$	South
#!	North-east
#@	North-west
$!	South-east
$@	South-west

Expression : P!11X#16S@3T!12Y; T#O@4J#!5Q$!13Y

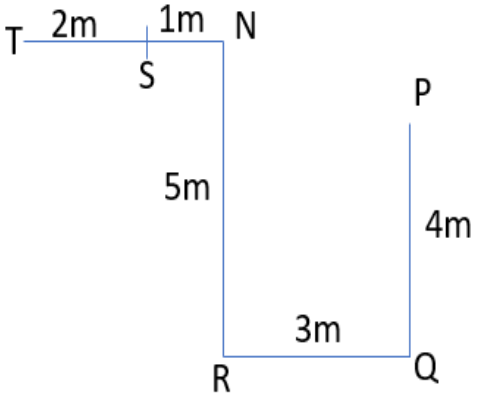


- **P is to the south-west of J.**

Q14 Text Solution:

Code	meaning
!	3m east
@	2m west
#	4m north
$	5m south

Expression : P#Q!R$N!T@S

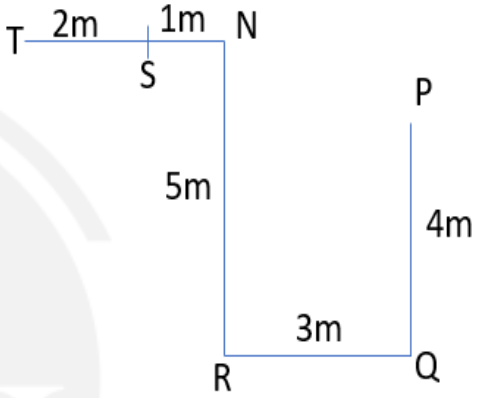


- **N is to the east of T, but others are to the south-east of T.**

Q15 Text Solution:

Code	meaning
!	3m east
@	2m west
#	4m north
$	5m south

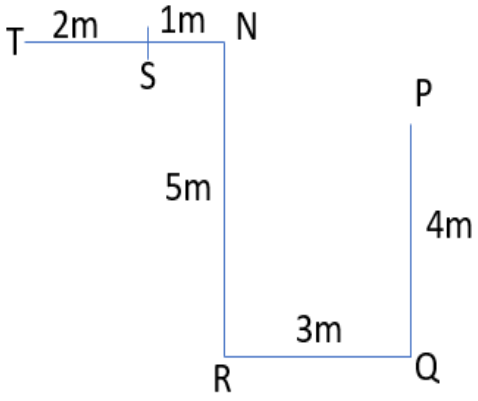
Expression : P#Q!R$N!T@S



Q16 Text Solution:

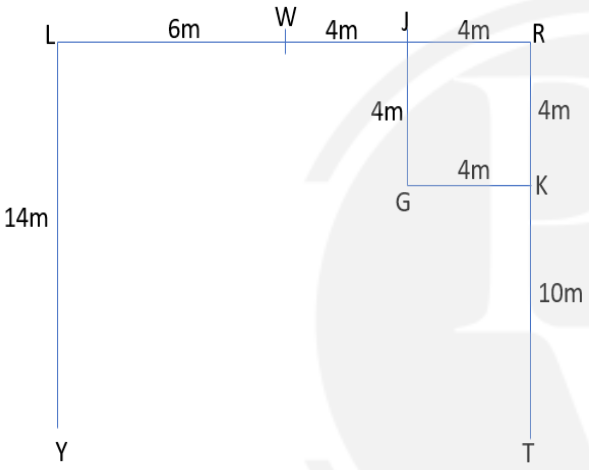
Code	meaning
!	3m east
@	2m west
#	4m north
$	5m south

Expression : P#Q!R$N!T@S



Q17 Text Solution:

Expression : G@2K#5T$7R!4W!3L#7Y

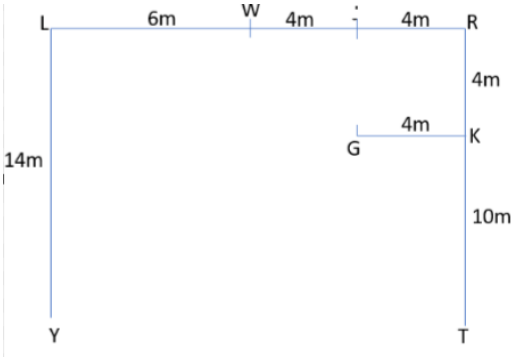


- **The distance between J and G is equal to the distance between R and K. Therefore, it is 4m.**

Code	Meaning
!4	*2 = 8m east
@7	*2 = 14m west
#5	*2 = 10m north
$2	*2 = 4m south

Q18 Text Solution:

Expression : G@2K#5T$7R!4W!3L#7Y



*** L is to the north of Y.**

Code	Meaning
!4	*2 = 8m east
@7	*2 = 14m west
#5	*2 = 10m north
$2	*2 = 4m south

Q19 Text Solution:

Expression : G@2K#5T$7R!4W!3L#7Y

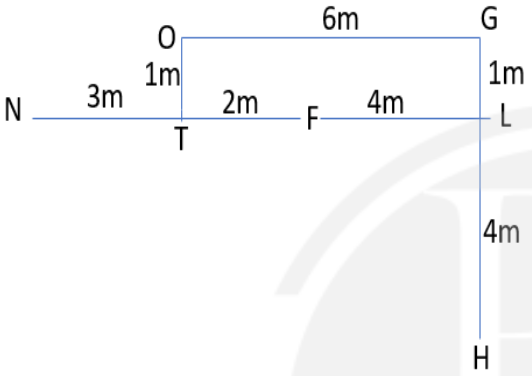
- **Y is to the west of T.**

Code	Meaning
!4	*2 = 8m east
@7	*2 = 14m west
#5	*2 = 10m north
$2	*2 = 4m south

Q20 Text Solution:

Code	Distance and Direction	
%5	-2m= 3m, north	
^6	-2m= 4m, south	
&4	-2m= 2m, east	
*7	-2m= 5m, west	

Expression : F&7N*5T^3O*8G%7H

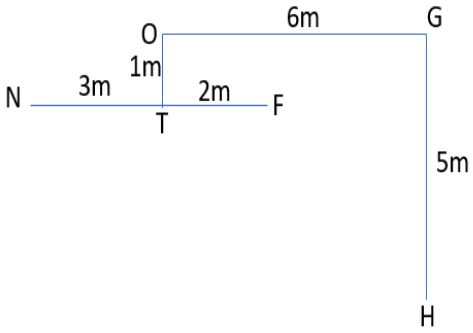


- **If L is 4m to the north of H,then it is 4m to the east of F and the distance between F and N is 5m.**
- **N is to the west of F.Therefore it is also to the west of L.**
- **So, N is 9m to the west of L.**

Q21 Text Solution:

Code	Distance and Direction	
%5	-2m= 3m, north	
^6	-2m= 4m, south	
&4	-2m= 2m, east	
*7	-2m= 5m, west	

Expression : F&7N*5T^3O*8G%7H

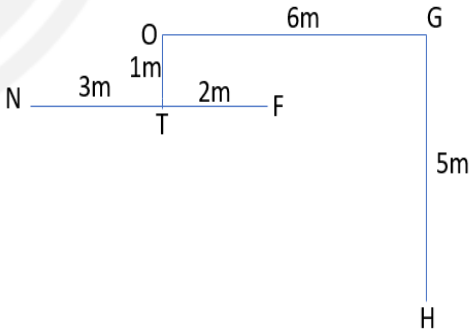


- **T is 2m to the west of F.**

Q22 Text Solution:

Code	Distance and Direction	
%5	-2m= 3m, north	
^6	-2m= 4m, south	
&4	-2m= 2m, east	
*7	-2m= 5m, west	

Expression : F&7N*5T^3O*8G%7H

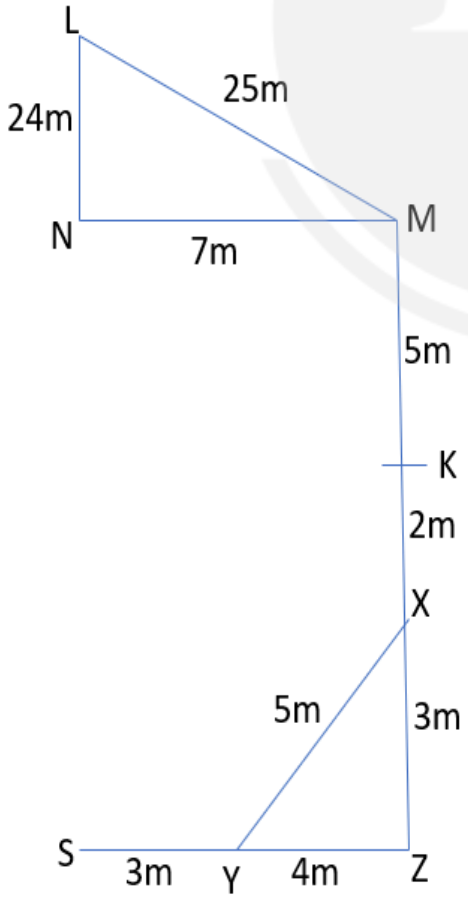


- **Only G is to the north of H and others are to the north-west of H.**

Q23 Text Solution:

Code	Meaning
%	North
^	South
&	East
*	West
%&	North-east
%*	North-west
^&	South-east
^*	South-west

Expression : X%&5Y*4Z^10M%5K; N*7M^*25L; Y&3S

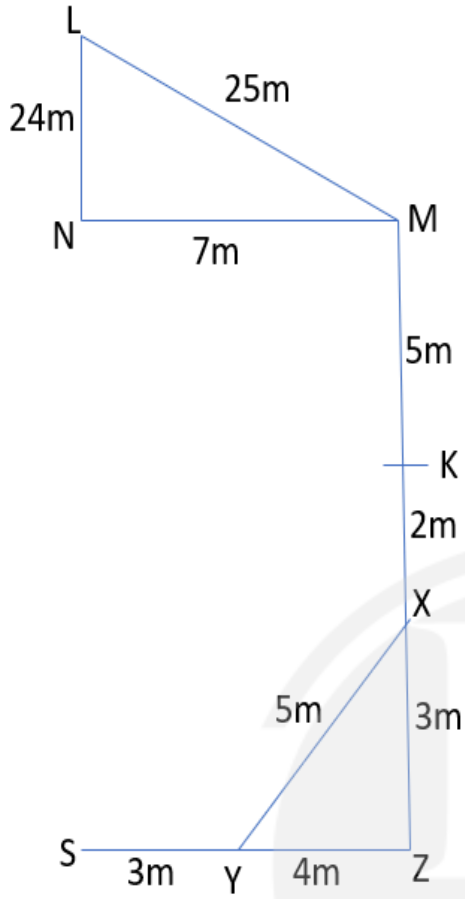


- The distance of LMKXY : LM+MK+KX+XY = 25m+5m+2m+5m = 37m

Q24 Text Solution:

Code	Meaning
%	North
^	South
&	East
*	West
%&	North-east
%*	North-west
^&	South-east
^*	South-west

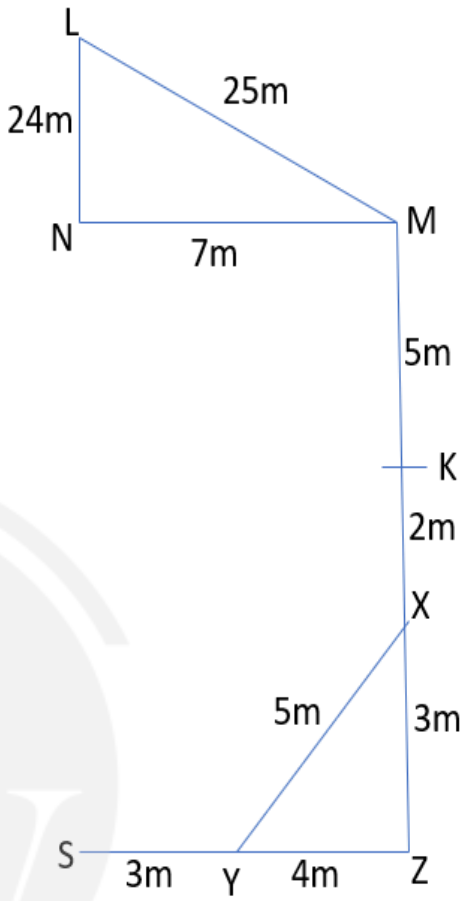
Expression : X%&5Y*4Z^10M%5K; N*7M^*25L; Y&3S



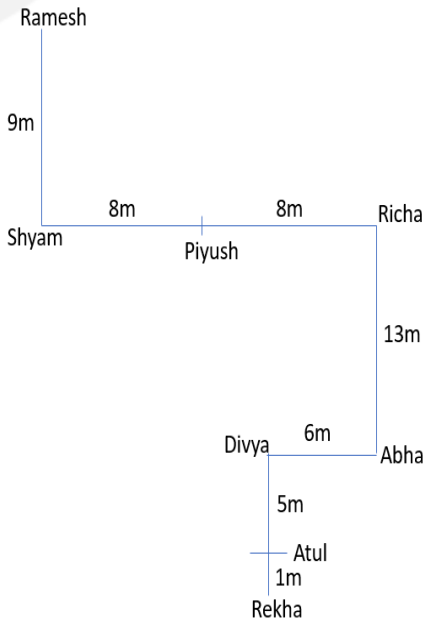
Q25 Text Solution:

Code	Meaning
%	North
^	South
&	East
*	West
%&	North-east
%*	North-west
^&	South-east
^*	South-west

Expression : X%&5Y*4Z^10M%5K; N*7M^*25L; Y&3S



Q26 Text Solution:

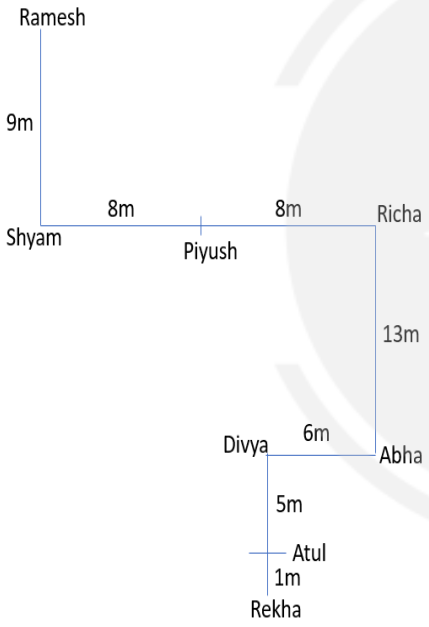


Symbol	Direction
#	North
$	South
!	East
@	West

- #8 = 10 (added 2)
- $21 = 19 (subtracted 2)
- !13 = 12 (subtracted 1)
- @4 = 4 (no change)

Q27 Text Solution:

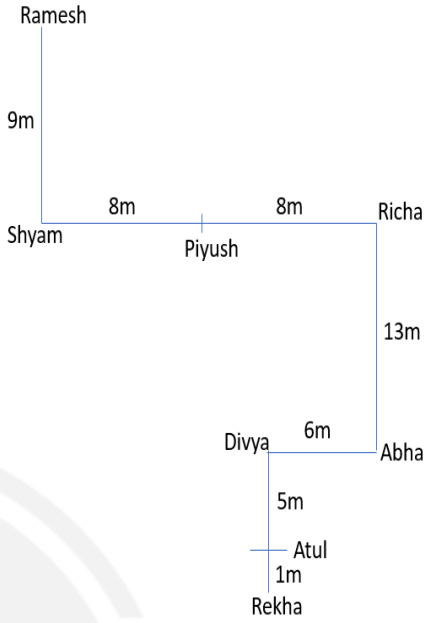
Distance : 9m+8m+8m+13m+6m+5m+1m = 50m



Symbol	Direction
#	North
$	South
!	East
@	West

- #8 = 10 (added 2)
- $21 = 19 (subtracted 2)
- !13 = 12 (subtracted 1)
- @4 = 4 (no change)

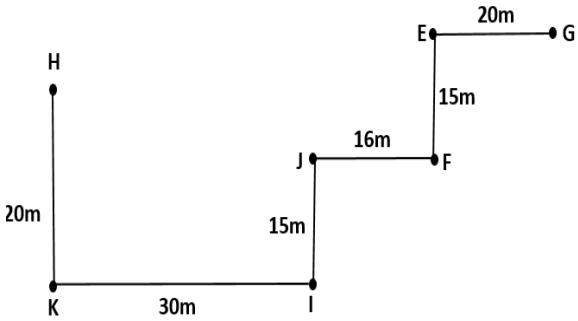
Q28 Text Solution:



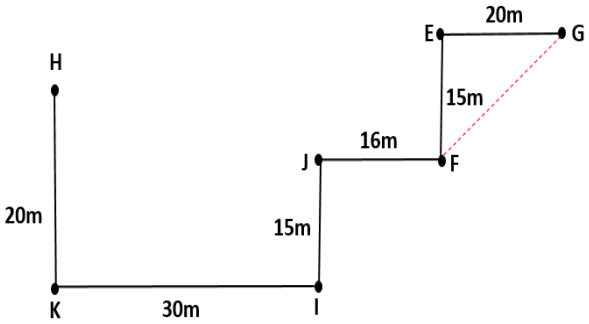
Symbol	Direction
#	North
$	South
!	East
@	West

- #8 = 10 (added 2)
- $21 = 19 (subtracted 2)
- !13 = 12 (subtracted 1)
- @4 = 4 (no change)

Q29 Text Solution:



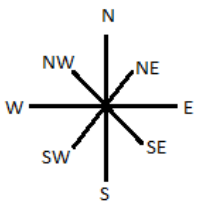
Q30 Text Solution:

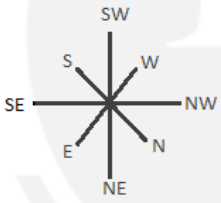


{FG}^{2} = {FE}^{2} + {GE}^{2}
= 15^{2} + 20^{2}
= 225 + 400
= 625
FG = $\sqrt{625}$
FG = 25m

Q31 Text Solution:

1. The first figure shows the meaning of the direction board initially and the second figure shows the meaning of the direction board after the bumping.

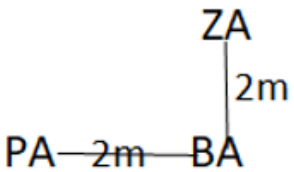




Stephan wanted to take the direction west (#) but according to the second figure, he took the south east ($@) direction.

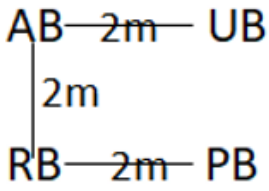
Q32 Text Solution:

1) BA is 2 m south of ZA.
2) PA is 2 m left of BA.



Q33 Text Solution:

1) RB is left of PB.
2) AB is north of RB.
3) UB is right of AB.



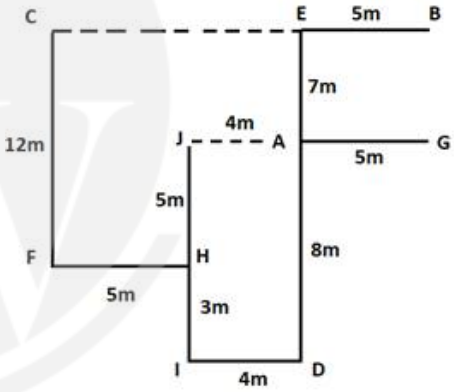
Q34 Text Solution:

Given expression: C%F (12m); F@H (5m); I@D (4m); I&H(3m); A%D (8m) A@G (5m); E%A (7m); B*E (5m)

After decoding the codes we get,

C%F (12m); C is 12m North of F, F@H (5m); F is 5m west of H, I@D (4m); I is 4m to the west of D, I&H(3m); I is 3m South of H, A%D (8m): A is 8m to the north of D, A@G (5m); A is 5m to the west of G, E%A (7m); E is 7 m to the north of A, B*E (5m): B is 5 m to the east of A.

The final diagram:



Hence, the distance between G and J will be 9m.

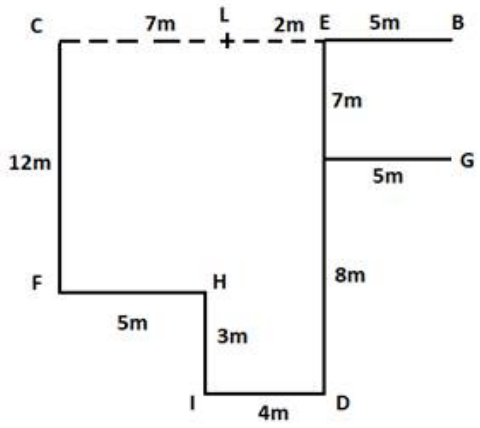
Q35 Text Solution:

Given expression: C%F (12m); F@H (5m); I@D (4m); I&H(3m); A%D (8m) A@G (5m); E%A (7m); B*E (5m)

After decoding the codes we get,

C%F (12m); C is 12m North of F, F@H (5m); F is 5m west of H, I@D (4m); I is 4m to the west of D, I&H(3m); I is 3m South of H, A%D (8m): A is 8m to the north of D, A@G (5m); A is 5m to the west of G, E%A (7m); E is 7 m to the north of A, B*E (5m): B is 5 m to the east of A.

The final diagram:



Hence, the distance between L and E would be 2m.

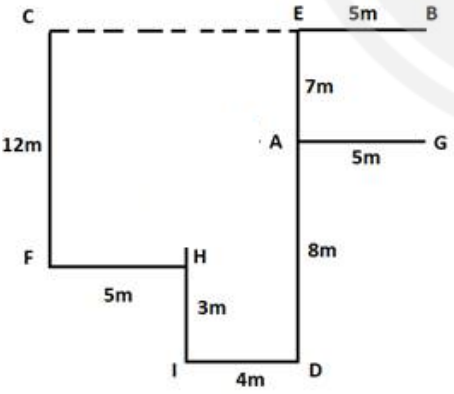
Q36 Text Solution:

Given expression: C%F (12m); F@H (5m); I@D (4m); I&H(3m); A%D (8m) A@G (5m); E%A (7m); B*E (5m)

After decoding the codes we get,

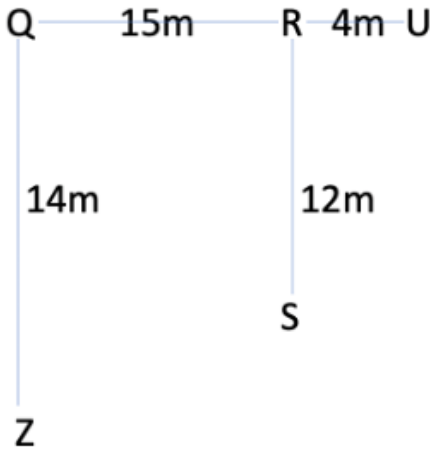
C%F (12m); C is 12m North of F, F@H (5m); F is 5m west of H, I@D (4m); I is 4m to the west of D, I&H(3m); I is 3m South of H, A%D (8m): A is 8m to the north of D, A@G (5m); A is 5m to the west of G, E%A (7m); E is 7 m to the north of A, B*E (5m): B is 5 m to the east of A.

The final diagram:

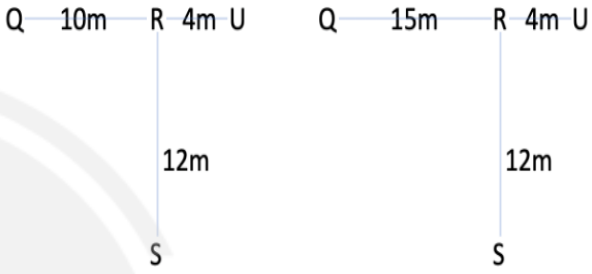


Hence, H is in the south-west to the B.

Q37 Text Solution:



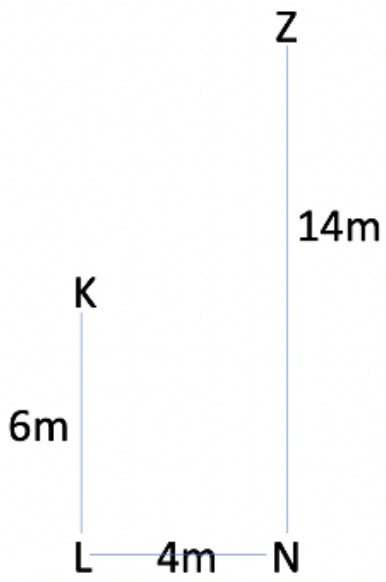
Q38 Text Solution:



Q39 Text Solution:

Required distance = 14 + 12 = 26m

Q40 Text Solution:



Required distance = $\sqrt{4^2 + 8^2} = \sqrt{80} = 4\sqrt{5}$m