



SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
COIMBATORE-35



DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

DIRECTION PROBLEMS

Directions are part of logical reasoning. It is one of the most commonly found topics in almost all the entrance exams. The topic requires analytical and logical skills to solve the s v g u k p u 0 0 c u g t k p i ' j g ' - F k t g e v k p u o ' v q r k e ' y k m j g r ' k p ' i c k p k p i ' g z r g t v k u g in seating arrangement.

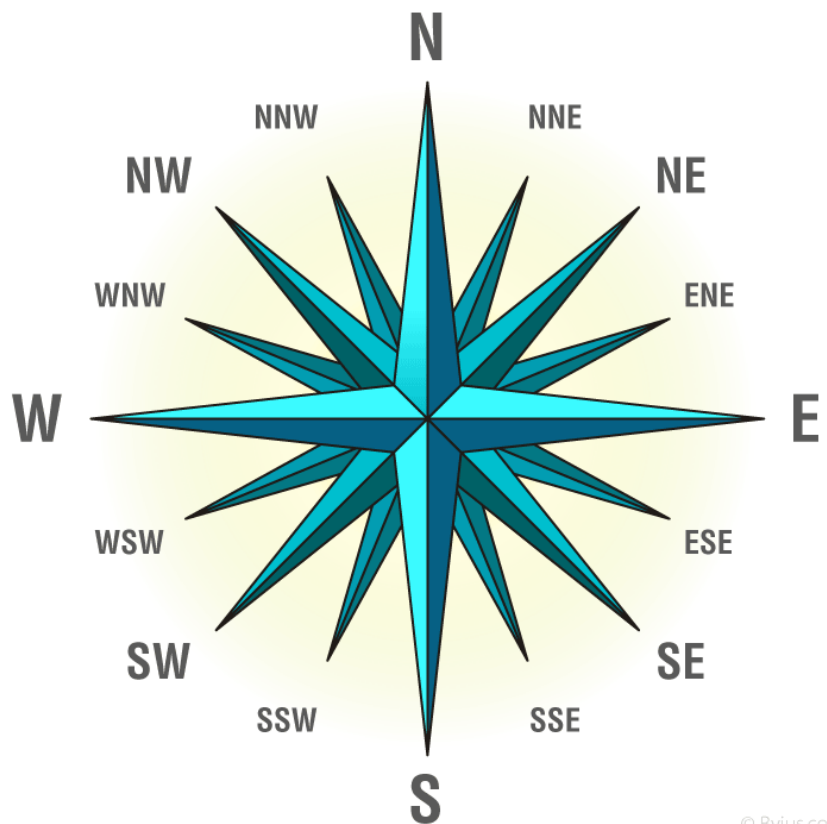
What is Direction?

Direction is the information contained in the relative position of one point with respect to another point without the distance information. Directions may be either relative to some indicated reference or absolute according to some previously agreed upon frame of reference.

Cardinal directions

The four cardinal directions or cardinal points are:

1. North
2. East
3. South
4. West



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Representation of all 16 cardinal directions



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

The intermediate directions of the four cardinal directions are:

Cardinal directions	
1	North ó West
2	North ó East
3	South ó West
4	South ó East

The intermediate directions are further classified as:

Intermediate directions	
North-North-West	West-North-West
North-North- East	East -North-East
South-South-West	West-South-West
South-South-East	East-South-East

Topics:



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

1. The right and left directional movement
2. The directional reference point
3. The directions of sun rays and shadow
4. The correct map v/s wrong map
5. Directions in Clocks
6. Directions in Seating arrangement

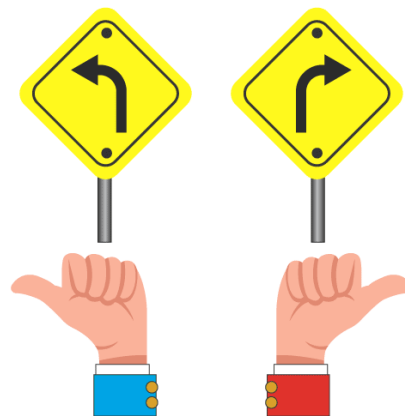
Assumptions:

The direction of the top of the page is always considered as North unless specified in the question.

Ex: The direction a person is facing at a present movement is always taken as north for convenience and thereby making the approach to solve the problem easier.

Topic 1: The Right and Left directional movement

The right and left movement of a person is always with reference to the body moving in the scenario. It is not with respect to the person who is solving the questions.



I want to know !

Which is my **left** hand ?

Which is my **right** hand ?

© E

Right and left directions



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

Direct yourself

A person is walking towards you, and after walking for a few meters, he takes a right turn. Which direction is he moving?

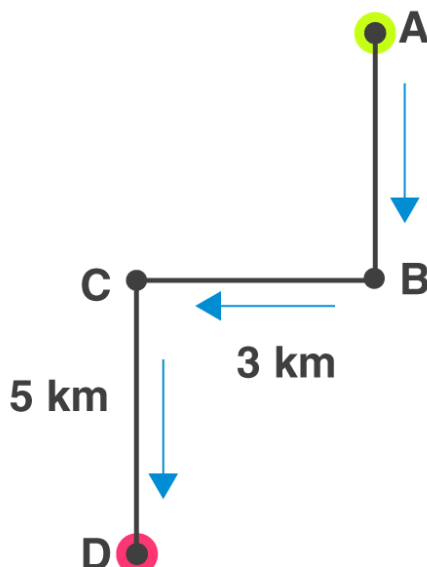
Solution: The direction we are facing is always assumed as North. Hence, if a person is walking towards us, he is walking facing (towards) South.

Example 1:

Mr Deepak Mohan walks 5 km towards the south and then turns to the right. After walking 3 km he turns to the left and walks 5 km. What direction is he facing right now?

- A. West
- B. South
- C. North-East
- D. South-West

Solution:



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

The right and left movements are with respect to Mr. Deepak Mohan. After walking 5 km towards the South, he takes a right turn and now will be facing West. After walking 3 more km he turns left and walks 5 more km. Now he is facing South.

Hence, the answer is option B.

Example 2:

Sowmya Krishnan walked 20 m towards the north. Then she turned right and walks 30 m. Then she turns right and walks 35 m. Then she turns left and walks 15 m. Finally she turns left and walks 15 m. In which direction and how many meters is she from the starting position?

A.15 m West

B.30 m East

C.30 m West

D.45 m East

Solution:



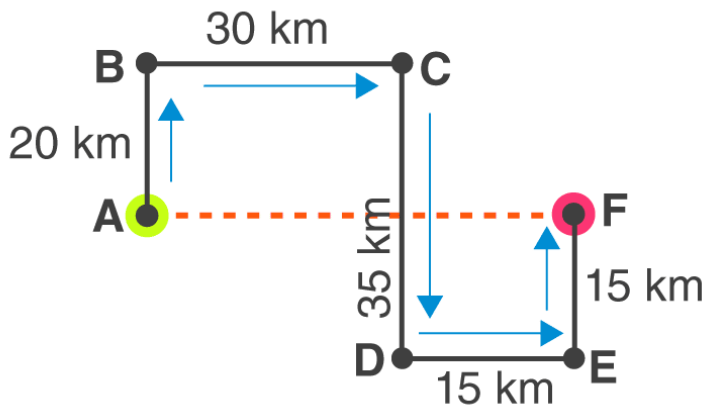
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UNIT -3 Analytical Reasoning



$$\begin{aligned}\text{Required distance} &= AF \\ &= 30 + 15 \\ &= 45\text{m}\end{aligned}$$

From the above diagram, **F** is in East direction from **A**, Hence the required answer is **45m East**

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(The path traced by Sowmya Krishnan)

Topic 2: The directional reference point

Observe the five cities on the map shown below. The five cities are New Delhi, Mumbai, Bengaluru, Chennai, and Kolkata.



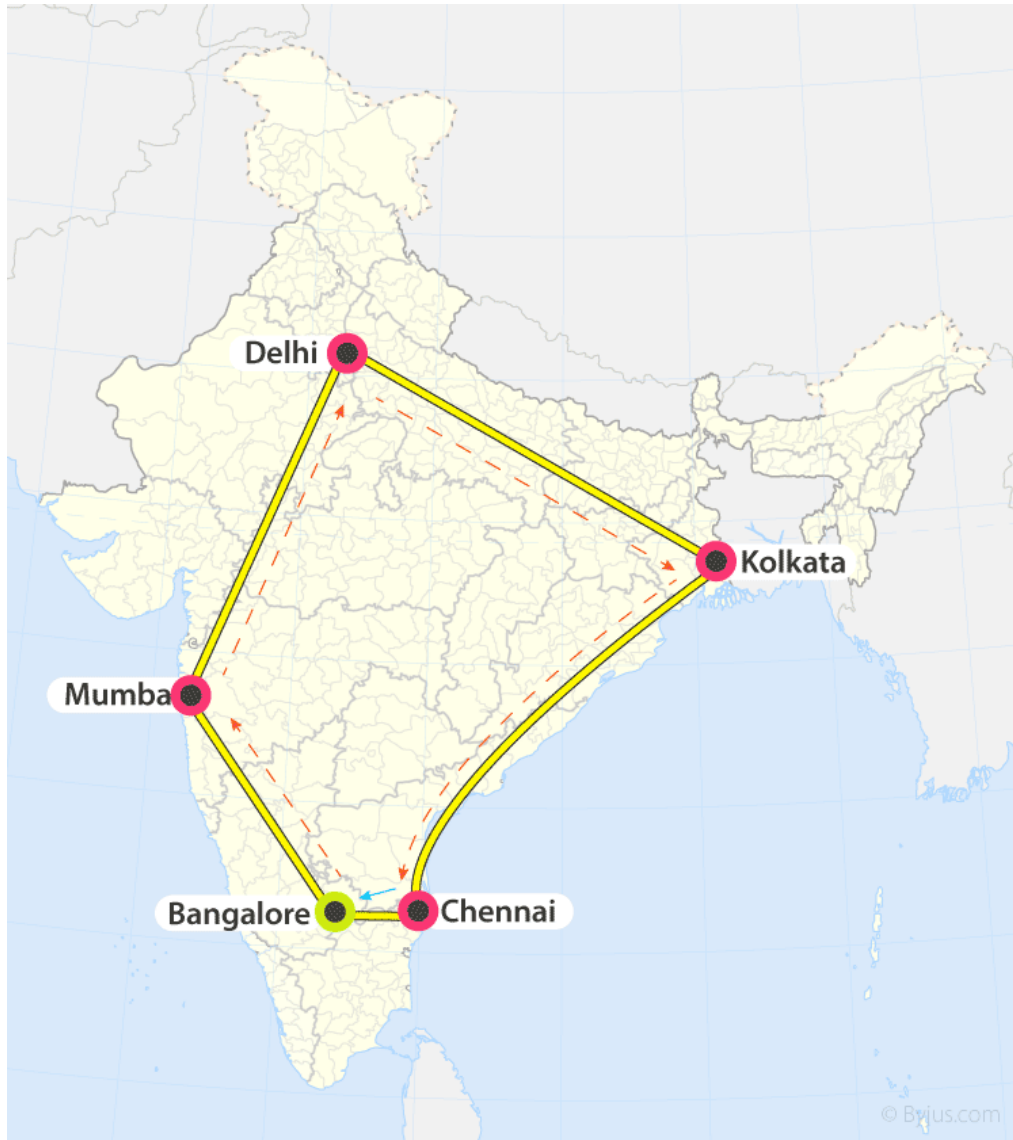
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UNIT -3 Analytical Reasoning



The directional reference point of five cities

The city Bengaluru is exactly below New Delhi, Hence, Bengaluru is in the South direction with respect to New Delhi whereas it is in the West direction with respect to Chennai.

Mumbai is in North West direction with respect to Bengaluru whereas Bengaluru is in the South-East direction with respect to Mumbai. One should draw a cardinal direction at a reference city/place to find the direction of the other city.



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

Example 3:

Mrs. Veena wants to go to the Krishna Rajendra market. She moved northwards and after covering some distance turned left and moved 4 km and reached a crossing. The road in front of her led to Jaynagar while the road on to her left led to Bangalore Medical College and the road on to her right led to the Krishna Rajendra market. In which direction the Krishna Rajendra market is located with reference to the starting point?

- A. West
- B. North-West
- C. South-West
- D. East

Solution:

Option B is the correct answer.

Topic 3: The directions of sun rays and shadow

A boy is playing with a skipping rope in the playground and is facing North in the morning then, he observes that his shadow was towards his left as the Sun appeared in the East. The boy turned 180 degrees while playing, he is facing the South now. His own shadow will be towards his right as the Sun is in the east.



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(An Autonomous Institution)
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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning



Sunrise/sunset and the shadow

He does this every day once in the morning and evening. He plays facing south and observed that his shadow was towards his left and then turns and faces North he observed that his shadow was towards his right. This is because in the morning the sun is in the East and in the evening the sun is in the West. When facing South, the shadow is cast to the left in the morning and to the right in the evening. When facing North, the shadow is cast to the right in the morning and to the left in the evening.

The table below summarises the relation of shadow with respect to the direction and time:

Direction v/s Time	Morning	Evening
North	Left	Right
South	Right	Left

Example 4:



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19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

One morning after sunrise, Nandita and Ravi were sitting in a lawn with their backs towards gcej "qvj gt0P cpf kcø'u'lj cf qy 'hgm'gzcew{ "qy ctf u'j gt'hghv-hand side. Which direction was Ravi facing?

- A. East
- B. West
- C. North
- D. South

Solution:

Ukpeg'k'y cu'o qtpkpi "cpf "P cpf kcø'u'lj cf qy 'hgm'gzcew{ "qv'j gt'hghv-hand side, Nandita was facing North and hence Ravi should be facing South. Hence the answer is option D.

Topic 4: Correct map v/s Wrong map

This section involves the comparison of two maps between which one is definitely wrong. One has to find the correct direction in the wrong map by applying logical analysis.

Example 5:

At a crossing, there was a direction pole, which was showing all the four correct directions. But due to the wind, it turns in such a manner that now West pointer is showing South. Harish went in the wrong direction thinking that he was travelling East. In what direction he was actually travelling?

- A. South
- B. North
- C. West
- D. East



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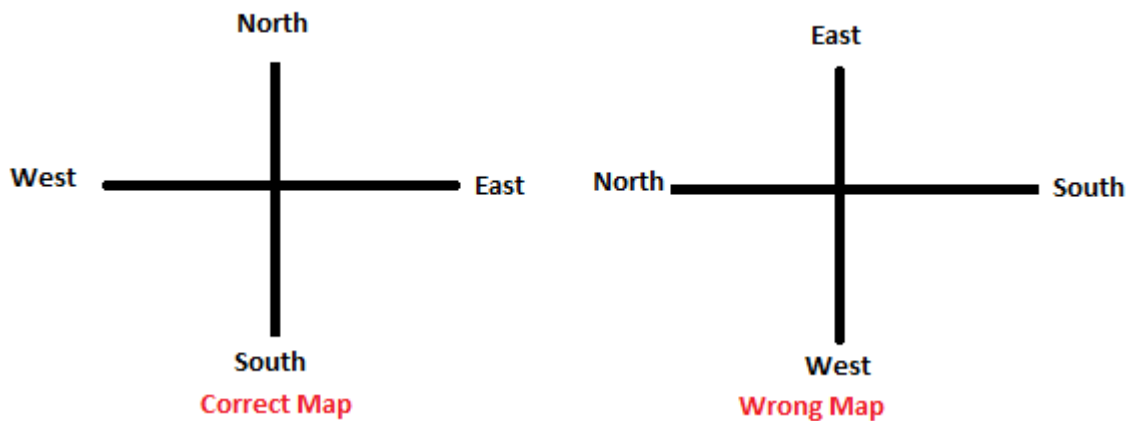
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19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

Solution:

The correct answer is option B, i.e., North.



To know more about [SSC JE Syllabus](#), check the linked article.

Topic 5: Directions in Clocks

All the pirates and travellers during the 16th and 17th Centuries used the compass as a navigation device which helped them in the discovery of the land that was unknown to mankind. The clocks were lacking directional information as the main task of the clock was just to tell the time.

Adding the directions to the clock paved the way to the invention of many ideas in the future. Vj g'f ktgevkp"lp'y j lej "vj g'pwo dgt":34ø'gzkxu'y cu'eqpukf gtgf "cu'yj g'P qth for the reference. Cpf "cm'yj g'tgo ckpki "f ktgevkpu'y gtg'o ctngf "ceeqtfl pi n{0J gpeg."vj g'pwo dgtu":5ø":8ø'cpf " ÷ ø'y gtg'eqpukf gtgf "vq'dg'cv'Gcu."Uqwj ."cpf "Y guv.'tgur gevkggn{0

North



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning



South

Pictorial representation of clocks with all the directions

Example 6:

A clock is so placed that at 2:00 p.m. the minute hand points towards North-west. In which direction does the hour hand point at 6:00 p.m.?

- A. North-West
- B. West
- C. North-East
- D. South-East



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

Solution:

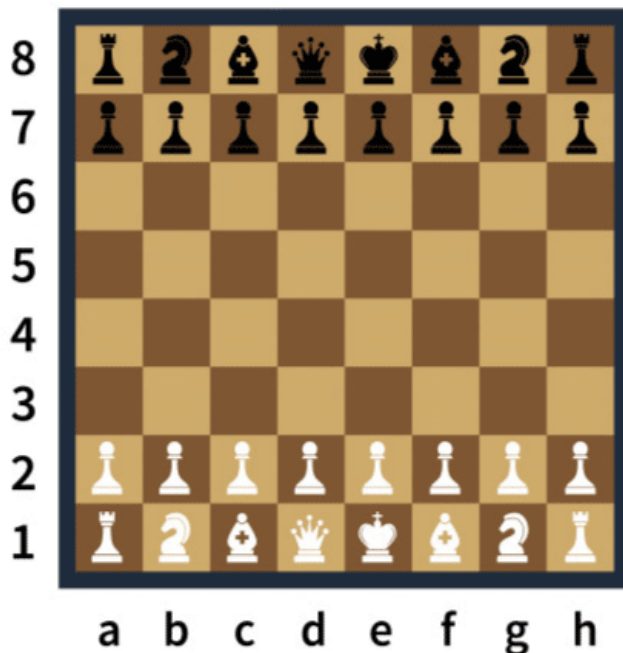
If the Minute hand is at 12 which is North-West, then at 6.00 p.m. the hour hand will be pointing at the number 6. Since the numbers 12 and 6 are exactly the opposite. The opposite of North-West should be South-East. Hence, option D is the correct answer.

Apart from the reasoning ability section, the syllabus for the various competitive exams includes other subjects. Candidates can check the detailed syllabus for the Government exams in the table given below:

Topic 6: Directions in board games

In this section, the directional concepts are applied to popular board games like Chess and Carrom board or Snake and ladder to solve the questions.

Example 7:





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19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

General placement of the chessboard

A chess piece undergoes the following motion during the game. It starts from D-8, and reaches H-5, from there it reaches A-3, finally, it moves to the position H-8 and dies. In what direction the piece was when it died if the chess board is assumed to be placed in front of you?

Solution:

The H-8 is the position where the chess piece died. If the chessboard is assumed to be placed in front of us, then the position H-8 will lie in between North and east. Hence, the answer is North-East.

Example 8:



General placement of carrom board

P, Q, R, and S are playing a game of carrom. P, R, and S, Q are partners. S is to the right of R who is facing west. Then Q is facing?

- A. North
- B. South
- C. East
- D. West



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

Solution:

Since R is facing West and P is the partner of R P is facing East. Also, S is to the right of R, so S will be facing South and Q is the partner of S. Therefore, Q will face North. Hence, option A is the correct answer.

To explore the [IBPS Syllabus](#), check the linked article.

Topic 7: Directions of Seating arrangement

This section involves the combination of directional logic with the seating arrangement.

Example 9:

J,K,L,M,N,O,P and R are eight huts. L is 2 km east of K. J is 1 km north of K and Q is 2 km south of J. P is 1 km west of Q while M is 3 km east of P and O is 2 km north of P. R is situated right in the middle of K and L while N is just in the middle of Q and M.

Distance between K and P is

- A. 1.0km
- B. 1.23 km
- C. 1.41 km
- D. 1.5 km

Solution:

Since K and P forms the diagonal of the right angle triangle KQP the distance between KP is 1.41 km. Hence, option C is the correct answer.

Distance between K and R is:

- A. 1.41 km



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DEPARTMENT OF AEROSPACE ENGINEERING

19GET275 – VQAR 1

UNIT -3 Analytical Reasoning

B. 3 km

C. 2 km

D. 1 km

Solution:

Since R is in the middle of K and L which are 2 km apart. The distance between K and R is 1km. Hence, option D is the correct answer.