CAT 2020 Question Paper with Solution
Slot 3 DILR

1.

|||Common||| Sixteen patients in a hospital must undergo a blood test for a disease. It is known that exactly one of them has the disease. The hospital has only eight testing kits and has decided to pool blood samples of patients into eight vials for the tests. The patients are numbered 1 through 16, and the vials are labelled A, B, C, D, E, F, G, and H. The following table shows the vials into which each patient's blood sample is distributed.

Patient	Vials	Patient	Vials
1	B, D, F, H	9	A, D, F, H
2	B, D, F, G	10	A, D, F, G
3	B, D, E, H	11	A, D, E, H
4	B, D, E, G	12	A, D, E, G
5	B, C, F, H	13	A, C, F, H
6	B, C, F, G	14	A, C, F, G
7	B, C, E, H	15	A, C, E, H
8	B, C, E, G	16	A, C, E, G

If a patient has the disease, then each vial containing his/her blood sample will test positive. If a vial tests positive, one of the patients whose blood samples were mixed in the vial has the disease. If a vial tests negative, then none of the patients whose blood samples were mixed in the vial have the disease.

|||End|||

Suppose vial C tests positive and vials A, E, and H test negative. Which patient has the disease?

A. Patient 6

B. Patient 2

C. Patient 14

D. Patient 8

Answer ||| A

Solution |||

We must look for the patient whose blood is in vial C but not in vial A, E, H. From the options, only Patient 6 satisfies the criteria. Hence, the answer is option A.

2. Suppose vial A tests positive and vials D and G test negative. Which of the following vials should we test next to identify the patient with the disease?

A. Vial B

B. Vial H

C. Vial C

D. Vial E

Answer ||| D

Solution |||

We must look for the patients whose blood is in vial A but not in vial D and G. From the table, we can find two such patients namely Patient 13 and Patient 15. The uncommon vials for patients 13 and 15 are vials E and F. Testing one of these two, we can identify the person with the disease.

Hence, option D is the correct answer.

3. Which of the following combinations of test results is NOT possible?

A. Vials A and E positive, vials C and D negative

B. Vials A and G positive, vials D and E negative

C. Vials B and D positive, vials F and H negative

D. Vial B positive, vials C, F, and H negative

Answer ||| A

Solution |||

We can solve this by checking the options.

Option B: We need to look for the patients whose blood is in vial A and G but not in vial D and E. Patient 14 satisfies the criteria. Hence, it is possible that vials A & G show positive test results and vials D & E show negative test results.

Option C: We need to look for the patients whose blood is in vial B and D but not in vial F and H. Patient 4 satisfies the criteria. Hence, it is possible that vials B & D show positive test results and vials F & H show negative test results.

Option D: We need to look for the patients whose blood is in vial B but not in vials C, F, and H. Patient 4 satisfies the criteria. Hence, it is possible that vial B shows positive test result and vials C, F, & E show negative test results.

Option A: We need to look for the patients whose blood is in vial A and E but not in vial C and D. None of the patients satisfy the criteria. Hence, it is NOT possible that vials A & E show positive test results and vials C & D show negative test results.

Hence, option A is the correct answer.

4. Suppose one of the lab assistants accidentally mixed two patients' blood samples before they were distributed to the vials. Which of the following correctly represents the set of all possible numbers of positive test results out of the eight vials?

A. {4, 5, 6, 7, 8}

B. {4, 5}

C. {5, 6, 7, 8}

D. {4, 5, 6, 7}

Answer ||| A

Solution |||

Let’s assume the blood sample of patient X is mixed with the blood sample of patient Y.

If both the patients X and Y are disease free, then only the 4 vials containing the blood sample of the infected person (which is neither X nor Y) will give the positive test result.

Now, if one of X and Y is infected, then all the vials containing blood samples of X and Y will give positive results. Now, the total number of vials containing blood samples of the given 16 patients can be 5, 6, 7, or 8 as explained below.

There are 5 vials which contain blood samples of patient 1 or patient 2. So, if patient 1 is having the disease and his blood sample is mixed with that of patient 2, then 5 vials will show positive test results.

There are 6 vials which contain blood samples of patient 1 or patient 4. So, if patient 1 is having the disease and his blood sample is mixed with that of patient 4, then 6 vials will show positive test results.

There are 7 vials which contain blood samples of patient 1 or patient 15. So, if patient 1 is having the disease and his blood sample is mixed with that of patient 15, then 7 vials will show positive test results.

There are 8 vials which contain blood samples of patient 1 or patient 16. So, if patient 1 is having the disease and his blood sample is mixed with that of patient 16, then all 8 vials will show positive test results.

So, the correct answer is option A.

###TOPIC###Data Interpretation||Tables||Tables###

5.

|||Common|||

The Hi-Lo game is a four-player game played in six rounds. In every round, each player chooses to bid Hi or Lo. The bids are made simultaneously. If all four bid Hi, then all four lose 1 point each. If three players bid Hi and one bids Lo, then the players bidding Hi gain 1 point each and the player bidding Lo loses 3 points. If two players bid Hi and two bid Lo, then the players bidding Hi gain 2 points each and the players bidding Lo lose 2 points each. If one player bids Hi and three bid Lo, then the player bidding Hi gains 3 points and the players bidding Lo lose 1 point each. If all four bid Lo, then all four gain 1 point each. Four players Arun, Bankim, Charu, and Dipak played the Hi-Lo game. The following facts are known about their game: 1. At the end of three rounds, Arun had scored 6 points, Dipak had scored 2 points, Bankim and Charu had scored −2 points each; 2. At the end of six rounds, Arun had scored 7 points, Bankim and Dipak had scored −1 point each, and Charu had scored -5 points; 3. Dipak's score in the third round was less than his score in the first round but was more than his score in the second round; 4. In exactly two out of the six rounds, Arun was the only player who bid Hi.

|||End|||
In how many rounds did Arun bid Hi?

Answer ||| 4

Solution |||

Using the information given in the paragraph, we can create the following table for the points scored by the 4 players in all possible cases.

Situation	Points scored by 4 players				Total Points of 4 players in Round
If all players bid Hi	-1	-1	-1	-1	-4
If 3 players bid Hi and 1player bids Lo	(Lo) -1	(Hi) 1	(Hi) 1	(Hi) 1	0
If 2 players bid Hi and 2 players bid Lo	(Lo) -2	(Lo)- 2	(Hi) 2	(Hi) 2	0
If 1 players bid Hi and 3 players bid Lo	(Hi) 3	(Lo)- 1	(Lo) -1	(Lo) -1	0
If all players bid Lo	1	1	1	1	4

We can notice that a player can score –3, –2, –1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 – 2 – 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score –1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored –1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, –1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6				7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2				-1
Total	0	0	4	4				0

For rounds 4, 5, and 6, we can write the following:

In exactly 2 rounds, Arun was the only player to bid Hi; so, he scored 3 points in exactly two rounds. So, the only combination of points for Arun in the 4th, 5th, and 6th round is 3, −1, and −1, not necessarily in the same order.

Since Arun scored 3 in one of the last three rounds, each of the other three players scored −1 in that round.

The only possible combination of points for Bankim in the 4th, 5th, and 6th rounds is −1, 3, and −1, not necessarily in same order.

In one of the last three rounds, Arun has scored 3 points, and in another round, Bankim scored 3 points; so, both Charu and Dipak will score −1 in each of those two rounds.

Using the above data, we will get the following table in which Round X, Round Y, and Round Z represent Round 4, Round 5, and Round 6, not necessarily in the same order.

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6	3 (Hi)	-1 (Lo)	-1 (Hi)	7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	3 (Hi)	-1 (Hi)	-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	-1 (Lo)	-1 (Hi)	-5
Dipak	2(Hi)	-1 (Lo)	1 (Lo)	2	-1 (Lo)	-1 (Lo)	-1(Hi)	-1
Total	0	0	4	4				0

From the table, we can see that Arun bid Hi in exactly 4 rounds.

6. In how many rounds did Bankim bid Lo?

Answer ||| 4

Solution |||

Using the information given in the paragraph, we can create the following table for the points scored by the 4 players in all possible cases.

Situation	Points scored by 4 players				Total Points of 4 players in Round
If all players bid Hi	-1	-1	-1	-1	-4
If 3 players bid Hi and 1player bids Lo	(Lo) -1	(Hi) 1	(Hi) 1	(Hi) 1	0
If 2 players bid Hi and 2 players bid Lo	(Lo) -2	(Lo)-2	(Hi) 2	(Hi) 2	0
If 1 players bid Hi and 3 players bid Lo	(Hi) 3	(Lo)-1	(Lo) -1	(Lo) -1	0
If all players bid Lo	1	1	1	1	4

We can notice that a player can score −3, −2, −1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 – 2 – 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score –1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored –1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, –1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6				7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2				-1
Total	0	0	4	4				0

For rounds 4, 5, and 6, we can write the following:

In exactly 2 rounds, Arun was the only player to bid Hi; so, he scored 3 points in exactly two rounds. So, the only combination of points for Arun in the 4th, 5th, and 6th round is 3, −1, and −1, not necessarily in the same order.

Since Arun scored 3 in one of the last three rounds, each of the other three players scored −1 in that round.

The only possible combination of points for Bankim in the 4th, 5th, and 6th rounds is −1, 3, and −1, not necessarily in same order.

In one of the last three rounds, Arun has scored 3 points, and in another round, Bankim scored 3 points; so, both Charu and Dipak will score −1 in each of those two rounds.

Using the above data, we will get the following table in which Round X, Round Y, and Round Z represent Round 4, Round 5, and Round 6, not necessarily in the same order.

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6	3 (Hi)	-1 (Lo)	-1 (Hi)	7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	3 (Hi)	-1 (Hi)	-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	-1 (Lo)	-1 (Hi)	-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2	-1 (Lo)	-1 (Lo)	-1(Hi)	-1
Total	0	0	4	4				0

From the table, we can see that Bankim bid Lo in exactly 4 rounds.

7. In how many rounds did all four players make identical bids?

Answer ||| 2

Solution |||

Using the information given in the paragraph, we can create the following table for the points scored by the 4 players in all possible cases.

Situation	Points scored by 4 players				Total Points of 4 players in Round
If all players bid Hi	-1	-1	-1	-1	-4
If 3 players bid Hi and 1player bids Lo	(Lo) -1	(Hi) 1	(Hi) 1	(Hi) 1	0
If 2 players bid Hi and 2 players bid Lo	(Lo) -2	(Lo)- 2	(Hi) 2	(Hi) 2	0
If 1 players bid Hi and 3 players bid Lo	(Hi) 3	(Lo)- 1	(Lo) -1	(Lo) -1	0
If all players bid Lo	1	1	1	1	4

We can notice that a player can score −3, −2, −1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 − 2 − 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score −1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored −1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, −1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:We can notice that a player can score −3, −2, −1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 − 2 − 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score −1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored −1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, −1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6				7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2				-1
Total	0	0	4	4				0

For rounds 4, 5, and 6, we can write the following:

In exactly 2 rounds, Arun was the only player to bid Hi; so, he scored 3 points in exactly two rounds. So, the only combination of points for Arun in the 4th, 5th, and 6th round is 3, −1, and −1, not necessarily in the same order.

Since Arun scored 3 in one of the last three rounds, each of the other three players scored −1 in that round.

The only possible combination of points for Bankim in the 4th, 5th, and 6th rounds is −1, 3, and −1, not necessarily in same order.

In one of the last three rounds, Arun has scored 3 points, and in another round, Bankim scored 3 points; so, both Charu and Dipak will score −1 in each of those two rounds.

Using the above data, we will get the following table in which Round X, Round Y, and Round Z represent Round 4, Round 5, and Round 6, not necessarily in the same order.

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6	3 (Hi)	-1 (Lo)	-1 (Hi)	7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	3 (Hi)	-1 (Hi)	-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	-1 (Lo)	-1 (Hi)	-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2	-1 (Lo)	-1 (Lo)	-1(Hi)	-1
Total	0	0	4	4				0

From the table, we can see that all players make identical bids in 2 rounds.

8. In how many rounds did Dipak gain exactly 1 point?

Answer ||| 2

Solution |||

Using the information given in the paragraph, we can create the following table for the points scored by the 4 players in all possible cases.

Situation	Points scored by 4 players				Total Points of 4 players in Round
If all players bid Hi	-1	-1	-1	-1	-4
If 3 players bid Hi and 1player bids Lo	(Lo) -1	(Hi) 1	(Hi) 1	(Hi) 1	0
If 2 players bid Hi and 2 players bid Lo	(Lo) -2	(Lo)- 2	(Hi) 2	(Hi) 2	0
If 1 players bid Hi and 3 players bid Lo	(Hi) 3	(Lo)- 1	(Lo) -1	(Lo) -1	0
If all players bid Lo	1	1	1	1	4

We can notice that a player can score −3, −2, −1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 − 2 − 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score −1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored −1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, −1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6				7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2				-1
Total	0	0	4	4				0

For rounds 4, 5, and 6, we can write the following:

In exactly 2 rounds, Arun was the only player to bid Hi; so, he scored 3 points in exactly two rounds. So, the only combination of points for Arun in the 4^{th}, 5^{th}, and 6^{th} round is 3, –1, and –1, not necessarily in the same order.

Since Arun scored 3 in one of the last three rounds, each of the other three players scored –1 in that round.

The only possible combination of points for Bankim in the 4^{th}, 5^{th}, and 6^{th} rounds is –1, 3, and –1, not necessarily in same order.

In one of the last three rounds, Arun has scored 3 points, and in another round, Bankim scored 3 points; so, both Charu and Dipak will score –1 in each of those two rounds.

Using the above data, we will get the following table in which Round X, Round Y, and Round Z represent Round 4, Round 5, and Round 6, not necessarily in the same order.

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6	3 (Hi)	-1 (Lo)	-1 (Hi)	7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	3 (Hi)	-1 (Hi)	-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	-1 (Lo)	-1 (Hi)	-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2	-1 (Lo)	-1 (Lo)	-1(Hi)	-1
Total	0	0	4	4				0

From the above table, we can see that Dipak gained 1 point in only 1 round.

9.

What were the bids by Arun, Bankim, Charu, and Dipak, respectively, in the first round?

A. Hi, Hi, Lo, Lo

B. Hi, Lo, Lo, Lo

C. Hi, Lo, Lo, Hi

D. Lo, Lo, Lo, Hi

Answer ||| C

Solution |||

Using the information given in the paragraph, we can create the following table for the points scored by the 4 players in all possible cases.

Situation	Points scored by 4 players				Total Points of 4 players in Round
If all players bid Hi	-1	-1	-1	-1	-4
If 3 players bid Hi and 1player bids Lo	(Lo) -1	(Hi) 1	(Hi) 1	(Hi) 1	0
If 2 players bid Hi and 2 players bid Lo	(Lo) -2	(Lo)- 2	(Hi) 2	(Hi) 2	0
If 1 players bid Hi and 3 players bid Lo	(Hi) 3	(Lo)- 1	(Lo) -1	(Lo) -1	0
If all players bid Lo	1	1	1	1	4

We can notice that a player can score –3, –2, –1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 – 2 – 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score –1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored –1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, –1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6				7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2				-1
Total	0	0	4	4				0

For rounds 4, 5, and 6, we can write the following:

In exactly 2 rounds, Arun was the only player to bid Hi; so, he scored 3 points in exactly two rounds. So, the only combination of points for Arun in the 4th, 5th, and 6th round is 3, −1, and −1, not necessarily in the same order.

Since Arun scored 3 in one of the last three rounds, each of the other three players scored −1 in that round.

The only possible combination of points for Bankim in the 4th, 5th, and 6th rounds is −1, 3, and −1, not necessarily in same order.

In one of the last three rounds, Arun has scored 3 points, and in another round, Bankim scored 3 points; so, both Charu and Dipak will score −1 in each of those two rounds.

Using the above data, we will get the following table in which Round X, Round Y, and Round Z represent Round 4, Round 5, and Round 6, not necessarily in the same order.

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6	3 (Hi)	-1 (Lo)	-1 (Hi)	7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	3 (Hi)	-1 (Hi)	-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	-1 (Lo)	-1 (Hi)	-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2	-1 (Lo)	-1 (Lo)	-1(Hi)	-1
Total	0	0	4	4				0

From the above table, we can see that in the first round, Arun, Bankim, Charu, and Dipak bid Hi, Lo, Lo, and Hi, respectively.

10.In which of the following rounds, was Arun DEFINITELY the only player to bid Hi? (TITA)

A. Second

B. Fourth

C. First

D. Third

Answer ||| A

Solution |||

Using the information given in the paragraph, we can create the following table for the points scored by the 4 players in all possible cases.

Situation	Points scored by 4 players				Total Points of 4 players in Round
If all players bid Hi	-1	-1	-1	-1	-4
If 3 players bid Hi and 1player bids Lo	(Lo) -1	(Hi) 1	(Hi) 1	(Hi) 1	0
If 2 players bid Hi and 2 players bid Lo	(Lo) -2	(Lo)- 2	(Hi) 2	(Hi) 2	0
If 1 players bid Hi and 3 players bid Lo	(Hi) 3	(Lo)- 1	(Lo) -1	(Lo) -1	0
If all players bid Lo	1	1	1	1	4

We can notice that a player can score −3, −2, −1, 1, 2, or 3 points in a round.

After the first three rounds, the total points of Arun are 6. There are only two combinations for this. Arun either scored 2 points in each of the first three rounds or he scored 3, 2, 1 points in the first three rounds, not necessarily in the same order.

Now, when a player scores 2 points in any round, the sum of the points of all four players in that round is 0. So, in each of the first three rounds, the sum of the points should be zero and therefore, the sum of the points of the players after 3 rounds should be zero 0 as the sum of points of Arun, Bankim, Charu, and Dipak after 3 rounds = 6 − 2 − 2 + 2 = 4.

Hence, Arun did not score 2 points in each of the first three rounds. So, he must have scored 3, 2, and 1 points in the first three rounds, not necessarily in the same order.

Since Arun scored 3 points in one of the first three rounds, Dipak must score −1 in that round. We also know that Dipak scored a total of 2 points in the first three rounds. The only possible combination is that Dipak scored −1, 1, and 2 points in the first three rounds.

Since it is given that his score in the third round was less than his score in the 1st round but more than his score in the 2nd round, we can conclude that his points in the 1st, 2nd, and 3rd round should be 2, −1, and 1, respectively.

Accordingly, Arun should score 2, 3, and 1 points in the 1st, 2nd, and 3rd rounds, respectively.

Using the above data and given statements, we can create the following table:

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6				7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2				-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2				-1
Total	0	0	4	4				0

For rounds 4, 5, and 6, we can write the following:

In exactly 2 rounds, Arun was the only player to bid Hi; so, he scored 3 points in exactly two rounds. So, the only combination of points for Arun in the 4^{th}, 5^{th}, and 6^{th} round is 3, –1, and –1, not necessarily in the same order.

Since Arun scored 3 in one of the last three rounds, each of the other three players scored –1 in that round.

The only possible combination of points for Bankim in the 4^{th}, 5^{th}, and 6^{th} rounds is –1, 3, and –1, not necessarily in same order.

In one of the last three rounds, Arun has scored 3 points, and in another round, Bankim scored 3 points; so, both Charu and Dipak will score –1 in each of those two rounds.

Using the above data, we will get the following table in which Round X, Round Y, and Round Z represent Round 4, Round 5, and Round 6, not necessarily in the same order.

	Points							
	Points in Round 1	Points in Round 2	Points in Round 3	Total After 3 Rounds	Points in Round X	Points in Round Y	Points in Round Z	Total After 6 Rounds
Arun	2 (Hi)	3 (Hi)	1 (Lo)	6	3 (Hi)	-1 (Lo)	-1 (Hi)	7
Bankim	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	3 (Hi)	-1 (Hi)	-1
Charu	-2 (Lo)	-1 (Lo)	1 (Lo)	-2	-1 (Lo)	-1 (Lo)	-1 (Hi)	-5
Dipak	2 (Hi)	-1 (Lo)	1 (Lo)	2	-1 (Lo)	-1 (Lo)	-1(Hi)	-1
Total	0	0	4	4				0

From the above table, we can see that Arun was the only player to bid Hi in the second round.

###TOPIC###Logical Reasoning||Tournaments||Tournaments###

11.

|||Common|||

A survey of 600 schools in India was conducted to gather information about their online teaching learning processes (OTLP). The following four facilities were studied.

F1: Own software for OTLP

F2: Trained teachers for OTLP

F3: Training materials for OTLP

F4: All students having laptops

The following observations were summarized from the survey.

1. 80 schools did not have any of the four facilities – F1, F2, F3, F4.

2. 40 schools had all four facilities.

3. The numbers of schools with only F1, only F2, only F3, and only F4 were 25, 30, 26, and 20, respectively.

4. The number of schools with exactly three of the facilities was the same irrespective of which three were considered.

5. 313 schools had F2.

6. 26 schools had only F2 and F3 (but neither F1 nor F4).

7. Among the schools having F4, 24 had only F3, and 45 had only F2.

8. 162 schools had both F1 and F2.

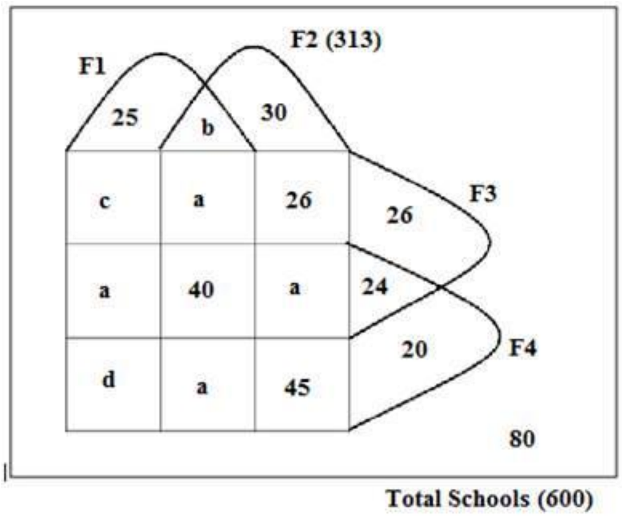
9. The number of schools having F1 was the same as the number of schools having F4.

|||End|||
What was the number of schools having only facilities F1 and F3?

Answer ||| 42

Solution |||

Using the given data, we can create the following venn diagram:



Number of schools having both F1 and F2 = 162 (statement 8)

b + a + 40 + a = 162

⇒ 2a + b = 122 ……………………………………………………………(1)

Number of schools having F2 = 313

b + 30 + a + 26 + 40 + a + a + 45 = 313

⇒ 3a + b = 172 ……………………………………………………………(2)

Solving equations (1) and (2), we get the following:

a = 50, b = 22 ……………………………………………………………(3)

Now,

Number of schools having F1 = Number of schools having F4 (statement 9)

25 + b + c + a + a + 40 + d + a = a + 40 + a + 24 + d + a + 45 + 20

⇒ c = 24 + 45 + 20 – 25 – b

⇒ c = 89 – 25 – 22

⇒ c = 42……………………………………………………………(4)

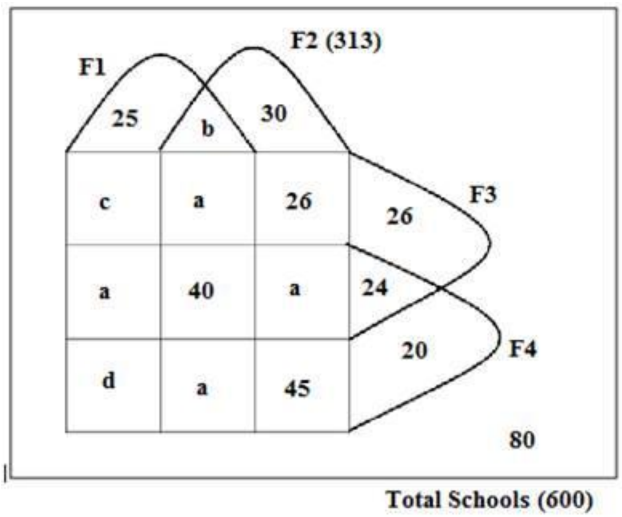
Number of schools having only facilities F1 and F3 = c = 42

12. What was the number of schools having only facilities F1 and F4?

Answer ||| 20

Solution |||

Using the given data, we can create the following venn diagram:



Number of schools having both F1 and F2 = 162 (statement 8)

b + a + 40 + a = 162

⇒ 2a + b = 122 ....(1)

Number of schools having F2 = 313

b + 30 + a + 26 + 40 + a + a + 45 = 313

⇒ 3a + b = 172 ....(2)

Solving equations (1) and (2), we get the following:

a = 50, b = 22 ....(3)

Now,

Number of schools having F1 = Number of schools having F4 (statement 9)

$25 + b + c + a + a + 40 + d + a = a + 40 + a + 24 + d + a + 45 + 20$

$\Rightarrow c = 24 + 45 + 20 - 25 - b$

$\Rightarrow c = 89 - 25 - 22$

$\Rightarrow c = 42$……………………………………………………………(4)

Total number of schools = 600

$25 + b + 30 + c + a + 26 + 26 + a + 40 + a + 24 + d + a + 45 + 20 + 80 = 600$

$\Rightarrow 4a + b + c + d + 316 = 600$

$\Rightarrow 4(50) + (22) + (42) + d + 316 = 600$

$\Rightarrow d = 20$ …………………………………………………………………(5)

Number of schools having only facilities F1 and F4 = d = 20

13.

What was the total number of schools having exactly three of the four facilities?

A. 80

B. 64

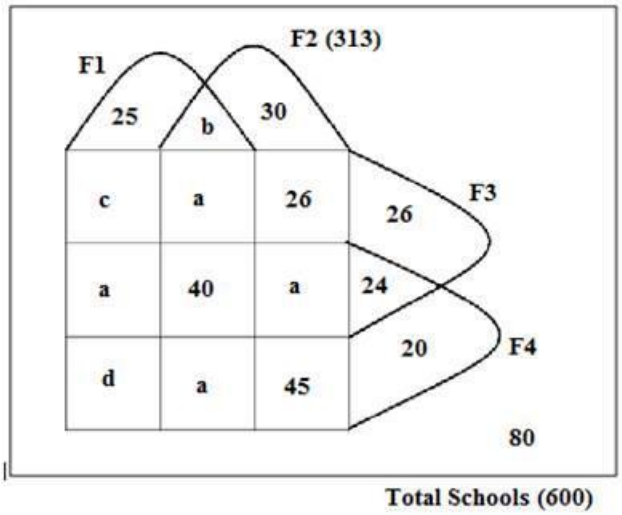
C. 50

D. 200

Answer ||| D

Solution |||

Using the given data, we can create the following venn diagram:



Number of schools having both F1 and F2 = 162 (statement 8)

b + a + 40 + a = 162

⇒ 2a + b = 122 ....(1)

Number of schools having F2 = 313

b + 30 + a + 26 + 40 + a + a + 45 = 313

⇒ 3a + b = 172 ....(2)

Solving equations (1) and (2), we get the following:

a = 50, b = 22 ....(3)

Hence, the total number of schools having exactly three of the four facilities = 4a = 200

14. What was the number of schools having facilities F2 and F4?

A. 95

B. 85

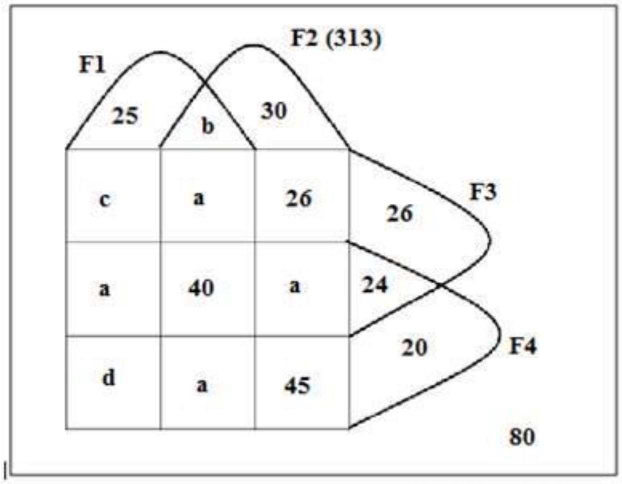
C. 185

D. 45

Answer ||| C

Solution |||

Using the given data, we can create the following venn diagram:



Number of schools having both F1 and F2 = 162 (statement 8)

b + a + 40 + a = 162

⇒ 2a + b = 122 ....(1)

Number of schools having F2 = 313

b + 30 + a + 26 + 40 + a + a + 45 = 313

⇒ 3a + b = 172 ....(2)

Solving equations (1) and (2), we get the following:

a = 50, b = 22 ....(3)

Number of schools having facilities F2 and F4 = 40 + a + a + 45

= 85 + 2a

= 85 + 2(50) = 185

###TOPIC###Logical Reasoning||Venn Diagrams||Venn Diagrams###

15.

|||Common||| XYZ organization got into the business of delivering groceries to home at the beginning of the last month. They have a two-day delivery promise. However, their deliveries are unreliable. An order booked on a particular day may be delivered the next day or the day after. If the order is not delivered at the end of two days, then the order is declared as lost at the end of the second day. XYZ then does not deliver the order, but informs the customer, marks the order as lost, returns the payment and pays a penalty for non-delivery. The following table provides details about the operations of XYZ for a week of the last month. The first column gives the date, the second gives the cumulative number of orders that were booked up to and including that day. The third column represents the number of orders delivered on that day. The last column gives the cumulative number of orders that were lost up to and including that day.

It is known that the numbers of orders that were booked on the 11th, 12th, and 13th of the last month that took two days to deliver were 4, 6, and 8, respectively.

Day	Cumulative orders booked	Orders delivered on day	Cumulative orders lost
13th	219	11	91
14th	249	27	92
15th	277	23	94
16th	302	11	106
17th	327	21	118
18th	332	13	120
19th	337	14	129

|||End|||

Among the following days, the largest fraction of orders booked on which day was lost?

A. 15th

B. 16th

C. 13th

D. 14th

Answer ||| A

Solution |||

If an order booked on 11th is delivered after two days, it will be delivered on the 13th.

Using the above logic and given data, we can create the following table:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11th					
12th					
13th		(11 - 4) = 7	4	11	
14th	(249 - 219) = 30	(27 - 6) = 21	6	27	(92 - 91) = 1
15th	(277 - 249) = 28	(23 - 8) = 15	8	23	(94 - 92) = 2
16th	(302 - 277) = 25			11	(106 - 94) = 12
17th	(327 - 302) = 25			21	(118 - 106) = 12
18th	(332 - 327) = 5			13	(120 - 118) = 2
19th	(337 - 332) = 5			14	(129 - 120) = 9

Total number of orders on the 13th = Number of orders delivered on the next day (on 14th) + Number of orders delivered after two days (on 15th) + Number of orders lost on the 15th

Total number of orders on the 13th = 21 + 8 + 2 = 31…………………..(1)

Similarly, we can write the following:

Total number of orders on 12th = 7 + 6 + 1 = 14 ………………….(2)

Number of orders delivered after two days (on 16th) = Total number of orders on 14th – Number of orders delivered on the next day (on 15th) – Number of orders lost on the 16th

Number of orders delivered after two days (on 16th) = 30 – 15 – 12 = 3 ………………….(3)

Number of orders delivered on the next day (on 16th) = Total number of orders delivered on the 16th – Number of orders delivered after two days (on 16th)

Number of orders delivered on the next day (on 16th) = 11 – 3 = 8

By similar calculations, we can complete the table as given below:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11th					
12th	14				
13th	31	7	4	11	
14th	30	21	6	27	1
15th	28	15	8	23	2
16th	25	8	3	11	12
17th	25	13	8	21	12
18th	5	3	10	13	2
19th	5	1	13	14	9

Fraction of orders lost which are booked on the 13th = 2/31 = 0.065

Fraction of orders lost which are booked on the 14th = 12/30 = 0.4

Fraction of orders lost which are booked on the 15th = 12/28 = 0.43

Fraction of orders lost which are booked on the 16th = 2/25 = 0.08

So, the largest fraction of orders booked on the 15th was lost.

16. On which of the following days was the number of orders booked the highest?

A. 13th

B. 12th

C. 15th

D. 14th

Answer ||| A

Solution |||

If an order booked on the 11th is delivered after two days, it will be delivered on the 13th.

Using the above logic and given data, we can create the following table:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11th					
12th					
13th		(11 - 4) = 7	4	11	
14th	(249 - 219) = 30	(27 - 6) = 21	6	27	(92 - 91) = 1
15th	(277 - 249) = 28	(23 - 8) = 15	8	23	(94 - 92) = 2
16th	(302 - 277) = 25			11	(106 - 94) = 12
17th	(327 - 302) = 25			21	(118 - 106) = 12
18th	(332 - 327) = 5			13	(120 - 118) = 2
19th	(337 - 332) = 5			14	(129 - 120) = 9

Total number of orders on the 13^{th} = Number of orders delivered on the next day (on 14^{th}) + Number of orders delivered after two days (on 15^{th}) + Number of orders lost on the 15^{th}

Total number of orders on the 13^{th} = 21 + 8 + 2 = 31…………………..(1)

Similarly, we can write the following:

Total number of orders on 12^{th} = 7 + 6 + 1 = 14 ………………….(2)

Number of orders delivered after two days (on 16^{th}) = Total number of orders on 14^{th} – Number of orders delivered on the next day (on 15^{th}) – Number of orders lost on the 16^{th}

Number of orders delivered after two days (on 16^{th}) = 30 – 15 – 12 = 3 ………………….(3)

Number of orders delivered on the next day (on 16^{th}) = Total number of orders delivered on the 16^{th} – Number of orders delivered after two days (on 16^{th})

Number of orders delivered on the next day (on 16^{th}) = 11 – 3 = 8

By similar calculations, we can complete the table as given below:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11^{th}					
12^{th}	14				
13^{th}	31	7	4	11	
14^{th}	30	21	6	27	1
15^{th}	28	15	8	23	2
16^{th}	25	8	3	11	12
17^{th}	25	13	8	21	12
18^{th}	5	3	10	13	2
19^{th}	5	1	13	14	9

From the above table, we can say that the highest number of orders were booked on the 13^{th}.

17. The *delivery ratio* for a given day is defined as the ratio of the number of orders booked on that day which are delivered on the next day to the number of orders booked on that day which are delivered on the second day after booking. On which of the following days was the *delivery ratio* the highest?

A. 16^{th}

B. 13^{th}

C. 15^{th}

D. 14^{th}

Answer ||| D

Solution |||

If an order booked on the 11^{th} is delivered after two days, it will be delivered on the 13^{th}.

Using the above logic and given data, we can create the following table:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11^{th}					
12^{th}					
13^{th}		(11 - 4) = 7	4	11	
14^{th}	(249 - 219) = 30	(27 - 6) = 21	6	27	(92 - 91) = 1
15^{th}	(277 - 249) = 28	(23 - 8) = 15	8	23	(94 - 92) = 2
16^{th}	(302 - 277) = 25			11	(106 - 94) = 12
17^{th}	(327 - 302) = 25			21	(118 - 106) = 12
18^{th}	(332 - 327) = 5			13	(120 - 118) = 2
19^{th}	(337 - 332) = 5			14	(129 - 120) = 9

Total number of orders on the 13^{th} = Number of orders delivered on the next day (on 14^{th}) + Number of orders delivered after two days (on 15^{th}) + Number of orders lost on the 15^{th}

Total number of orders on the 13^{th} = 21 + 8 + 2 = 31…………………..(1)

Similarly, we can write the following:

Total number of orders on 12^{th} = 7 + 6 + 1 = 14 …………………(2)

Number of orders delivered after two days (on 16^{th}) = Total number of orders on 14^{th} – Number of orders delivered on the next day (on 15^{th}) – Number of orders lost on the 16^{th}

Number of orders delivered after two days (on 16^{th}) = 30 – 15 – 12 = 3 …………………(3)

Number of orders delivered on the next day (on 16^{th}) = Total number of orders delivered on the 16^{th} – Number of orders delivered after two days (on 16^{th})

Number of orders delivered on the next day (on 16^{th}) = 11 – 3 = 8

By similar calculations, we can complete the table as given below:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11th					
12th	14				
13th	31	7	4	11	
14th	30	21	6	27	1
15th	28	15	8	23	2
16th	25	8	3	11	12
17th	25	13	8	21	12
18th	5	3	10	13	2
19th	5	1	13	14	9

Delivery ratio on the 13th = 21/8 = 2.625

Delivery ratio on the 14th = 15/3 = 5

Delivery ratio on the 15th = 8/8 = 1

Delivery ratio on the 16th = 13/10 = 1.3

So, the delivery ratio was highest on the 14th.

18. The average time taken to deliver orders booked on a particular day is computed as follows. Let the number of orders delivered the next day be 'x' and the number of orders delivered the day after be 'y'. Then, the average time to deliver an order is (x + 2y)/(x + y). On which of the following days was the average time taken to deliver the orders booked the least?

A. 14th

B. 13th

C. 16th

D. 15th

Answer ||| A

Solution |||

If an ordered booked on the 11th is delivered after two days, it will be delivered on the 13th.

Using the above logic and given data, we can create the following table:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11th					
12th					
13th		(11 - 4) = 7	4	11	
14th	(249 - 219) = 30	(27 - 6) = 21	6	27	(92 - 91) = 1
15th	(277 - 249) = 28	(23 - 8) = 15	8	23	(94 - 92) = 2
16th	(302 - 277) = 25			11	(106 - 94) = 12
17th	(327 - 302) = 25			21	(118 - 106) = 12
18th	(332 - 327) = 5			13	(120 - 118) = 2
19th	(337 - 332) = 5			14	(129 - 120) = 9

Total number of orders on the 13th = Number of orders delivered on the next day (on 14th) + Number of orders delivered after two days (on 15th) + Number of orders lost on the 15th

Total number of orders on the 13th = 21 + 8 + 2 = 31…………………..(1)

Similarly, we can write the following:

Total number of orders on 12th = 7 + 6 + 1 = 14 …………………(2)

Number of orders delivered after two days (on 16th) = Total number of orders on 14th – Number of orders delivered on the next day (on 15th) – Number of orders lost on the 16th

Number of orders delivered after two days (on 16th) = 30 – 15 – 12 = 3 ………………….(3)

Number of orders delivered on the next day (on 16th) = Total number of orders delivered on the 16th – Number of orders delivered after two days (on 16th)

Number of orders delivered on the next day (on 16th) = 11 – 3 = 8

By similar calculations, we can complete the table as given below:

Date	Total Number of orders	Number of orders delivered on next day	Number of orders delivered after two days	Total ordered delivered	Number of orders lost
11th					
12th	14				
13th	31	7	4	11	
14th	30	21	6	27	1
15th	28	15	8	23	2
16th	25	8	3	11	12
17th	25	13	8	21	12
18th	5	3	10	13	2
19th	5	1	13	14	9

Average delivery time taken to deliver orders booked on the 13th = $\frac{21+2\times 8}{21+8}=1.28$

Average delivery time taken to deliver orders booked on the 14th = $\frac{15+2\times 3}{15+3}=1.17$

Average delivery time taken to deliver orders booked on the 15th = $\frac{8+2\times 8}{8+8}=1.5$

Average delivery time taken to deliver orders booked on the 16th = $\frac{13+2\times 10}{13+10}=1.43$

So, the average delivery time was the least for orders booked on the 14th.

###TOPIC###Data Interpretation||Tables||Tables###

19.

|||Common||| A farmer had a rectangular land containing 205 trees. He distributed that land among his four daughters – Abha, Bina, Chitra, and Dipti by dividing the land into twelve plots along three rows (X, Y, Z) and four columns (1, 2, 3, 4) as shown in the figure below:

	1	2	3	4
X	12 C			
Y	21 A			A
Z	B	C	9	28

The plots in rows X, Y, Z contained mango, teak, and pine trees, respectively. Each plot had trees in non-zero multiples of 3 or 4 and none of the plots had the same number of trees. Each daughter got an even number of plots. In the figure, the number mentioned in top left corner of a plot is the number of trees in that plot, while the letter in the bottom right corner is the first letter of the name of the daughter who got that plot (For example, Abha got the plot in row Y and column 1 containing 21 trees). Some information in the figure got erased, but the following is known:

1. Abha got 20 trees more than Chitra but 6 trees less than Dipti.

2. The largest number of trees in a plot was 32, but it was not with Abha.

3. The number of teak trees in column 3 was double of that in column 2 but was half of that in column 4.

4. Both Abha and Bina got a higher number of plots than Dipti.

5. Only Bina, Chitra, and Dipti got corner plots.

6. Dipti got two adjoining plots in the same row.

7. Bina was the only one who got a plot in each row and each column.

8. Chitra and Dipti did not get plots which were adjacent to each other (either in row/column/diagonal).

9. The number of mango trees was double the number of teak trees.

|||End|||

Which of the following is the correct sequence of trees received by Abha, Bina, Chitra, and Dipti in that order?

A. 60, 39, 40, 66

B. 50, 69, 30, 56

C. 54, 57, 34, 60

D. 44, 87, 24, 50

Answer ||| B

Solution |||

Let the number of teak trees in columns 2, 3, and 4 be x, 2x, and 4x, respectively.

Here, x should be a multiple of 3 or 4.

If x = 3, then the number of teak trees in column 4 = 12

This is not possible as the number of mango trees in column 1 is also 12 and it is given that none of the plots had the same number of trees.

If x = 6, then the number of teak trees in column 3 = 12, which is not possible.

If x = 8, then the number of teak trees in column 4 = 32, which is with Abha, but according to statement 2, it is not possible.

x cannot be greater than 8 as in that case, the number of oak trees in column 4 will become greater than 32, which again is not possible.

So, the only possibility is x = 4 and the number of teak trees in columns 2, 3, and 4 are 4, 8, and 16, respectively.

Total number of teak trees = 21 + 4 + 8 + 16 = 49

Total number of mango trees = 2 × 49 = 98 (using statement 9)

Total number of pine trees = 205 – 49 – 98 = 58

Using the above values, we can create the following table:

		1	2	3	4	Total
X	Mango	12 C				98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9	28	58
	Total					205

Now, using statement 8 and 6, the two adjacent plots that Dipti can get can only be the plots of mango trees in column 3 and column 4. Also, these two plots should be the only plots that Dipti can have as each one of them had an even number of plots.

The number of plots that Abha and Bina had should be an even number higher than 2. Since there are a total of 12 plots and Chitra and Dipti already had 2 plots each, both Abha and Bina should have 4 plots each.

It is given that Abha cannot have a corner plot; so, Bina should have the plot having pine trees in column 4. Also, Bina has plots in each row and column; so, she should have the plot in the first row and second column. The fourth plot of Bina should be in the second row.

So, Abha should have the plot in the third row and third column.

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	B	D	D	98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9 A	28 B	58
	Total					205

Now, the fourth plot of Abha should either have 4 teak trees or 8 teak trees.

Case 1: Abha's fourth plot is in the 2nd row and 3rd column.

Total number of trees with Abha = 21 + 8 + 16 + 9 = 54

Using statement 1, we can write the following:

Total number of trees with Chitra = 54 – 20 = 34

Number of pine trees with Chitra = 34 – 12 = 22

This is not possible as 22 is not a multiple of 3 or 4.

Case 2: Abha's fourth plot is in the 2nd row and 2nd column.

Total number of trees with Abha = 21 + 4 + 16 + 9 = 50

Using statement 1, we can write the following:

Total number of trees with Chitra = 50 – 20 = 30

Number of pine trees with Chitra = 30 – 12 = 18 (multiple of 3)

Number of pine trees with Bina = 58 – 28 – 9 – 18 = 3 (multiple of 3)

Total number of trees with Bina = 205 – 50 – 30 – 56 = 69

Number of teak trees with Bina = 8 (only plot left in 2nd row)

Number of mango trees with Bina = 69 – 8 – 3 – 28 = 30 (multiple of 3)

Since one of the remaining plots should have 32 trees, the only combination left for the number of trees in two plots of Dipti is (32, 24).

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	30 B	32/24 D	32/24 D	98
Y	Teak	21 A	4 A	8 B	16 A	49
Z	Pine	3 B	18 C	9 A	28 B	58
	Total	36	52	41/49	68/76	205

Total number of trees with A = 21 + 4 + 16 + 9 = 50

Total number of trees with B = 30 + 8 + 3 + 28 = 69

Total number of trees with C = 12 + 18 = 30

Total number of trees with D = 32 + 24 = 56

A, B, C, and D got 50, 69, 30, and 56 trees, respectively.

20. How many pine trees did Chitra receive?

A. 21

B. 30

C. 15

D. 18

Answer ||| D

Solution |||

Let the number of teak trees in columns 2, 3, and 4 be x, 2x, and 4x, respectively.

Here, x should be a multiple of 3 or 4.

If x = 3, then the number of teak trees in column 4 = 12

This is not possible as the number of mango trees in column 1 is also 12 and it is given that none of the plots had the same number of trees.

If x = 6, then the number of teak trees in column 3 = 12, which is not possible.

If x = 8, then the number of teak trees in column 4 = 32, which is with Abha, but according to statement 2, it is not possible.

x cannot be greater than 8 as in that case, the number of oak trees in column 4 will become greater than 32, which again is not possible.

So, the only possibility is x = 4 and the number of teak trees in columns 2, 3, and 4 are 4, 8, and 16, respectively.

Total number of teak trees = 21 + 4 + 8 + 16 = 49

Total number of mango trees = 2 × 49 = 98 (using statement 9)

Total number of pine trees = 205 – 49 – 98 = 58

Using the above values, we can create the following table:

		1	2	3	4	Total
X	Mango	12 C				98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9	28	58
	Total					205

Now, using statement 8 and 6, the two adjacent plots that Dipti can get can only be the plots of mango trees in column 3 and column 4. Also, these two plots should be the only plots that Dipti can have as each one of them had an even number of plots.

The number of plots that Abha and Bina had should be an even number higher than 2. Since there are a total of 12 plots and Chitra and Dipti already had 2 plots each, both Abha and Bina should have 4 plots each.

It is given that Abha cannot have a corner plot; so, Bina should have the plot having pine trees in column 4. Also, Bina has plots in each row and column; so, she should have the plot in the first row and second column. The fourth plot of Bina should be in the second row.

So, Abha should have the plot in the third row and third column.

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	B	D	D	98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9 A	28 B	58
	Total					205

Now, the fourth plot of Abha should either have 4 teak trees or 8 teak trees.

Case 1: Abha's fourth plot is in the 2^{nd} row and 3^{rd} column.

Total number of trees with Abha = 21 + 8 + 16 + 9 = 54

Using statement 1, we can write the following:

Total number of trees with Chitra = 54 – 20 = 34

Number of pine trees with Chitra = 34 – 12 = 22

This is not possible as 22 is not a multiple of 3 or 4.

Case 2: Abha's fourth plot is in the 2^{nd} row and 2^{nd} column.

Total number of trees with Abha = 21 + 4 + 16 + 9 = 50

Using statement 1, we can write the following:

Total number of trees with Chitra = 50 – 20 = 30

Number of pine trees with Chitra = 30 – 12 = 18 (multiple of 3)

21.Who got the plot with the smallest number of trees and how many trees did that plot have?

A. Bina, 4 trees

B. Dipti, 6 trees

C. Abha, 4 trees

D. Bina, 3 trees

Answer ||| D

Solution |||

Let the number of teak trees in columns 2, 3, and 4 be x, 2x, and 4x, respectively.

Here, x should be a multiple of 3 or 4.

If x = 3, then the number of teak trees in column 4 = 12

This is not possible as the number of mango trees in column 1 is also 12 and it is given that none of the plots had the same number of trees.

If x = 6, then the number of teak trees in column 3 = 12, which is not possible.

If x = 8, then the number of teak trees in column 4 = 32, which is with Abha, but according to statement 2, it is not possible.

x cannot be greater than 8 as in that case, the number of oak trees in column 4 will become greater than 32, which again is not possible.

So, the only possibility is x = 4 and the number of teak trees in columns 2, 3, and 4 are 4, 8, and 16, respectively.

Total number of teak trees = 21 + 4 + 8 + 16 = 49

Total number of mango trees = 2 × 49 = 98 (using statement 9)

Total number of pine trees = 205 – 49 – 98 = 58

Using the above values, we can create the following table:

		1	2	3	4	Total
X	Mango	**12** **C**				98
Y	Teak	**21** **A**	**4**	**8**	**16** **A**	49
Z	Pine	**B**	**C**	**9**	**28**	58
	Total					205

Now, using statement 8 and 6, the two adjacent plots that Dipti can get can only be the plots of mango trees in column 3 and column 4. Also, these two plots should be the only plots that Dipti can have as each one of them had an even number of plots.

The number of plots that Abha and Bina had should be an even number higher than 2. Since there are a total of 12 plots and Chitra and Dipti already had 2 plots each, both Abha and Bina should have 4 plots each.

It is given that Abha cannot have a corner plot; so, Bina should have the plot having pine trees in column 4. Also, Bina has plots in each row and column; so, she should have the plot in the first row and second column. The fourth plot of Bina should be in the second row.

So, Abha should have the plot in the third row and third column.

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	B	D	D	98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9 A	28 B	58
	Total					205

Now, the fourth plot of Abha should either have 4 teak trees or 8 teak trees.

Case 1: Abha's fourth plot is in the 2nd row and 3rd column.

Total number of trees with Abha = 21 + 8 + 16 + 9 = 54

Using statement 1, we can write the following:

Total number of trees with Chitra = 54 – 20 = 34

Number of pine trees with Chitra = 34 – 12 = 22

This is not possible as 22 is not a multiple of 3 or 4.

Case 2: Abha's fourth plot is in the 2nd row and 2nd column.

Total number of trees with Abha = 21 + 4 + 16 + 9 = 50

Using statement 1, we can write the following:

Total number of trees with Chitra = 50 – 20 = 30

Number of pine trees with Chitra = 30 – 12 = 18 (multiple of 3)

Number of pine trees with Bina = 58 – 28 – 9 – 18 = 3 (multiple of 3)

Total number of trees with Bina = 205 – 50 – 30 – 56 = 69

Number of teak trees with Bina = 8 (only plot left in 2nd row)

Number of mango trees with Bina = 69 – 8 – 3 – 28 = 30 (multiple of 3)

Since one of the remaining plots should have 32 trees, the only combination left for the number of trees in two plots of Dipti is (32, 24).

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	30 B	32/24 D	32/24 D	98
Y	Teak	21 A	4 A	8 B	16 A	49
Z	Pine	3 B	18 C	9 A	28 B	58
	Total	36	52	41/49	68/76	205

From the above table, we can say that Bina got the plot with the smallest number of trees, i.e., 3.

22. Which of the following statements is NOT true?

A. Bina got 32 pine trees.

B. Chitra got 12 mango trees.

C. Abha got 41 teak trees.

D. Dipti got 56 mango trees.

Answer ||| A

Solution |||

Let the number of teak trees in columns 2, 3, and 4 be x, 2x, and 4x, respectively.

Here, x should be a multiple of 3 or 4.

If x = 3, then the number of teak trees in column 4 = 12

This is not possible as the number of mango trees in column 1 is also 12 and it is given that none of the plots had the same number of trees.

If x = 6, then the number of teak trees in column 3 = 12, which is not possible.

If x = 8, then the number of teak trees in column 4 = 32, which is with Abha, but according to statement 2, it is not possible.

x cannot be greater than 8 as in that case, the number of oak trees in column 4 will become greater than 32, which again is not possible.

So, the only possibility is x = 4 and the number of teak trees in columns 2, 3, and 4 are 4, 8, and 16, respectively.

Total number of teak trees = 21 + 4 + 8 + 16 = 49

Total number of mango trees = 2 × 49 = 98 (using statement 9)

Total number of pine trees = 205 – 49 – 98 = 58

Using the above values, we can create the following table:

		1	2	3	4	Total
X	Mango	**12** **C**				98
Y	Teak	**21** **A**	**4**	**8**	**16** **A**	49
Z	Pine	**B**	**C**	**9**	**28**	58
	Total					205

Now, using statement 8 and 6, the two adjacent plots that Dipti can get can only be the plots of mango trees in column 3 and column 4. Also, these two plots should be the only plots that Dipti can have as each one of them had an even number of plots.

The number of plots that Abha and Bina had should be an even number higher than 2. Since there are a total of 12 plots and Chitra and Dipti already had 2 plots each, both Abha and Bina should have 4 plots each.

It is given that Abha cannot have a corner plot; so, Bina should have the plot having pine trees in column 4. Also, Bina has plots in each row and column; so, she should have the plot in the first row and second column. The fourth plot of Bina should be in the second row.

So, Abha should have the plot in the third row and third column.

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	B	D	D	98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9 A	28 B	58
	Total					205

Now, the fourth plot of Abha should either have 4 teak trees or 8 teak trees.

Case 1: Abha's fourth plot is in the 2^{nd} row and 3^{rd} column.

Total number of trees with Abha = 21 + 8 + 16 + 9 = 54

Using statement 1, we can write the following:

Total number of trees with Chitra = 54 – 20 = 34

Number of pine trees with Chitra = 34 – 12 = 22

This is not possible as 22 is not a multiple of 3 or 4.

Case 2: Abha's fourth plot is in the 2^{nd} row and 2^{nd} column.

Total number of trees with Abha = 21 + 4 + 16 + 9 = 50

Using statement 1, we can write the following:

Total number of trees with Chitra = 50 – 20 = 30

Number of pine trees with Chitra = 30 – 12 = 18 (multiple of 3)

Number of pine trees with Bina = 58 – 28 – 9 – 18 = 3 (multiple of 3)

Total number of trees with Bina = 205 – 50 – 30 – 56 = 69

Number of teak trees with Bina = 8 (only plot left in 2^{nd} row)

Number of mango trees with Bina = 69 – 8 – 3 – 28 = 30 (multiple of 3)

Since one of the remaining plots should have 32 trees, the only combination left for the number of trees in two plots of Dipti is (32, 24).

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	30 B	32/24 D	32/24 D	98
Y	Teak	21 A	4 A	8 B	16 A	49
Z	Pine	3 B	18 C	9 A	28 B	58
	Total	36	52	41/49	68/76	205

From the above table, we can say that statement A is not true as Bina got 31 (28 + 3) pine trees.

23. Which column had the highest number of trees?

A. 4

B. 2

C. Cannot be determined

D. 3

Answer ||| A

Solution |||

Let the number of teak trees in columns 2, 3, and 4 be x, 2x, and 4x, respectively.

Here, x should be a multiple of 3 or 4.

If x = 3, then the number of teak trees in column 4 = 12

This is not possible as the number of mango trees in column 1 is also 12 and it is given that none of the plots had the same number of trees.

If x = 6, then the number of teak trees in column 3 = 12, which is not possible.

If x = 8, then the number of teak trees in column 4 = 32, which is with Abha, but according to statement 2, it is not possible.

x cannot be greater than 8 as in that case, the number of oak trees in column 4 will become greater than 32, which again is not possible.

So, the only possibility is x = 4 and the number of teak trees in columns 2, 3, and 4 are 4, 8, and 16, respectively.

Total number of teak trees = 21 + 4 + 8 + 16 = 49

Total number of mango trees = 2 × 49 = 98 (using statement 9)

Total number of pine trees = 205 – 49 – 98 = 58

Using the above values, we can create the following table:

		1	2	3	4	Total
X	Mango	12 C				98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9	28	58
	Total					205

Now, using statement 8 and 6, the two adjacent plots that Dipti can get can only be the plots of mango trees in column 3 and column 4. Also, these two plots should be the only plots that Dipti can have as each one of them had an even number of plots.

The number of plots that Abha and Bina had should be an even number higher than 2. Since there are a total of 12 plots and Chitra and Dipti already had 2 plots each, both Abha and Bina should have 4 plots each.

It is given that Abha cannot have a corner plot; so, Bina should have the plot having pine trees in column 4. Also, Bina has plots in each row and column; so, she should have the plot in the first row and second column. The fourth plot of Bina should be in the second row.

So, Abha should have the plot in the third row and third column.

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	B	D	D	98
Y	Teak	21 A	4	8	16 A	49
Z	Pine	B	C	9 A	28 B	58
	Total					205

Now, the fourth plot of Abha should either have 4 teak trees or 8 teak trees.

Case 1: Abha's fourth plot is in the 2^{nd} row and 3^{rd} column.

Total number of trees with Abha = 21 + 8 + 16 + 9 = 54

Using statement 1, we can write the following:

Total number of trees with Chitra = 54 – 20 = 34

Number of pine trees with Chitra = 34 – 12 = 22

This is not possible as 22 is not a multiple of 3 or 4.

Case 2: Abha's fourth plot is in the 2^{nd} row and 2^{nd} column.

Total number of trees with Abha = 21 + 4 + 16 + 9 = 50

Using statement 1, we can write the following:

Total number of trees with Chitra = 50 – 20 = 30

Number of pine trees with Chitra = 30 – 12 = 18 (multiple of 3)

Number of pine trees with Bina = 58 – 28 – 9 – 18 = 3 (multiple of 3)

Total number of trees with Bina = 205 – 50 – 30 – 56 = 69

Number of teak trees with Bina = 8 (only plot left in 2^{nd} row)

Number of mango trees with Bina = 69 – 8 – 3 – 28 = 30 (multiple of 3)

Since one of the remaining plots should have 32 trees, the only combination left for the number of trees in two plots of Dipti is (32, 24).

Substituting the above information, we get the following table:

		1	2	3	4	Total
X	Mango	12 C	30 B	32/24 D	32/24 D	98
Y	Teak	21 A	4 A	8 B	16 A	49
Z	Pine	3 B	18 C	9 A	28 B	58
	Total	36	52	41/49	68/76	205

From the above table, we can say that the 4th column has the highest number of trees.

24. How many mango trees were there in total?

A. 126

B. 84

C. 49

D. 98

Answer ||| D

Solution |||

Let the number of teak trees in column 2, 3, and 4 be x, 2x, and 4x, respectively.

Here, x should be a multiple of 3 or 4.

If x = 3, then the number of teak trees in column 4 = 12

This is not possible as the number of mango trees in column 1 is also 12 and it is given that none of the plots had the same number of trees.

If x = 6, then the number of teak trees in column 3 = 12, which is not possible.

If x = 8, then the number of teak trees in column 4 = 32, which is with Abha, but according to statement 2, it is not possible.

'x' cannot be greater than 8 as in that case, the number of oak trees in column 4 will become greater than 32, which again is not possible.

So, the only possibility is x = 4 and the number of teak trees in columns 2, 3, and 4 are 4, 8, and 16, respectively.

Total number of teak trees = 21 + 4 + 8 + 16 = 49

Total number of mango trees = 2 × 49 = 98

###TOPIC###Data Interpretation||Tables||Tables###