CAT 2018 Question Paper Slot 1

LRDI

Instructions [35 - 38]

Adriana, Bandita, Chitra, and Daisy are four female students, and Amit, Barun, Chetan, and Deb are four male students. Each of them studies in one of three institutes - X, Y, and Z. Each student majors in one subject among Marketing, Operations, and Finance, and minors in a different one among these three subjects. The following facts are known about the eight students:

1. Three students are from X, three are from Y, and the remaining two students, both female, are from Z.
2. Both the male students from Y minor in Finance, while the female student from Y majors in Operations.
3. Only one male student majors in Operations, while three female students minor in Marketing.
4. One female and two male students major in Finance.
5. Adriana and Deb are from the same institute. Daisy and Amit are from the same institute.
6. Barun is from Y and majors in Operations. Chetan is from X and majors in Finance.
7. Daisy minors in Operations.

35. Who are the students from the institute Z?

A Chitra and Daisy

B Adriana and Bandita

C Bandita and Chitra

D Adriana and Daisy

36. Which subject does Deb minor in?

A Operations

B Finance

C Marketing

D Cannot be determined uniquely from the given information

37. Which subject does Amit major in?

A Marketing

B Operations

C Cannot be determined uniquely from the given information

D Finance

38. If Chitra majors in Finance, which subject does Bandita major in?

A Finance

B Cannot be determined uniquely from the given information

C Operations

D Marketing

Instructions [39 - 42]

An ATM dispenses exactly Rs. 5000 per withdrawal using 100, 200 and 500 rupee notes. The ATM requires every customer to give her preference for one of the three denominations of notes. It then dispenses notes such that the number of notes of the customer's preferred denomination exceeds the total number of notes of other denominations dispensed to her.

39. In how many different ways can the ATM serve a customer who gives 500 rupee notes as her preference?

40. If the ATM could serve only 10 customers with a stock of fifty 500 rupee notes and a sufficient number of notes of other denominations, what is the maximum number of customers among these 10 who could have given 500 rupee notes as their preferences?

41. What is the maximum number of customers that the ATM can serve with a stock of fifty 500 rupee notes and a sufficient number of notes of other denominations, if all the customers are to be served with at most 20 notes per withdrawal?

A 12

B 10

C 13

D 16

42. What is the number of 500 rupee notes required to serve 50 customers with 500 rupee notes as their preferences and another 50 customers with 100 rupee notes as their preferences, if the total number of notes to be dispensed is the smallest possible?

A 900

B 800

C 750

D 1400

Instructions [43 - 46]

You are given an n×n square matrix to be filled with numerals so that no two adjacent cells have the same numeral. Two cells are called adjacent if they touch each other horizontally, vertically or diagonally. So a cell in one of the four corners has three cells adjacent to it, and a cell in the first or last row or column which is not in the corner has five cells adjacent to it. Any other cell has eight cells adjacent to it.

43. What is the minimum number of different numerals needed to fill a 3×3 square matrix?

44. What is the minimum number of different numerals needed to fill a 5×5 square matrix?

45. Suppose you are allowed to make one mistake, that is, one pair of adjacent cells can have the same numeral. What is the minimum number of different numerals required to fill a 5×5 matrix?

A 4

B 16

C 9

D 25

46. Suppose that all the cells adjacent to any particular cell must have different numerals. What is the minimum number of different numerals needed to fill a 5×5 square matrix?

A 25

B 4

C 16

D 9

Instructions [47 - 50]

Fuel contamination levels at each of 20 petrol pumps P1, P2, ..., P20 were recorded as either high, medium, or low.

1. Contamination levels at three pumps among P1 - P5 were recorded as high.
2. P6 was the only pump among P1 - P10 where the contamination level was recorded as low.
3. P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded.
4. High contamination levels were not recorded at any of the pumps P16 - P20.
5. The number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded.

47. Which of the following MUST be true?

A The contamination level at P20 was recorded as medium.

B The contamination level at P13 was recorded as low.

C The contamination level at P12 was recorded as high.

D The contamination level at P10 was recorded as high.

48. What best can be said about the number of pumps at which the contamination levels were recorded as medium?

A At least 8

B More than 4

C Exactly 8

D At most 9

49. If the contamination level at P11 was recorded as low, then which of the following MUST be true?

A The contamination level at P12 was recorded as high.

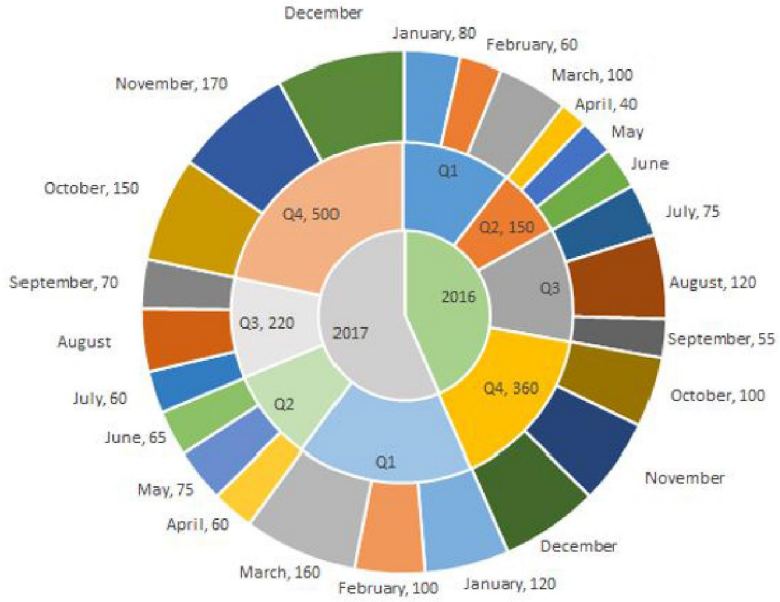
B The contamination level at P15 was recorded as medium.

C The contamination level at P18 was recorded as low.

D The contamination level at P14 was recorded as medium.

Instructions [51 - 54]

The multi-layered pie-chart below shows the sales of LED television sets for a big retail electronics outlet during 2016 and 2017. The outer layer shows the monthly sales during this period, with each label showing the month followed by sales figure of that month. For some months, the sales figures are not given in the chart. The middle-layer shows quarterwise aggregate sales figures (in some cases, aggregate quarter-wise sales numbers are not given next to the quarter). The innermost layer shows annual sales. It is known that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression, as do the three monthly sales figures in the fourth quarter (October, November, December) of that year.



51. What is the percentage increase in sales in December 2017 as compared to the sales in December 2016?

A 38.46

B 22.22

C 28.57

D 50.00

52. In which quarter of 2017 was the percentage increase in sales from the same quarter of 2016 the highest?

A Q2

B Q1

C Q4

D Q3

53. During which quarter was the percentage decrease in sales from the previous quarter's sales the highest?

A Q2 of 2017

B Q4 of 2017

C Q2 of 2016

D Q1 of 2017

54. During which month was the percentage increase in sales from the previous month's sales the highest?

A March of 2017

B October of 2017

C March of 2016

D October of 2016

Instructions [55 - 58]

Twenty four people are part of three committees which are to look at research, teaching, and administration respectively. No two committees have any member in common. No two committees are of the same size. Each committee has three types of people: bureaucrats, educationalists, and politicians, with at least one from each of the three types in each committee. The following facts are also known about the committees:

1. The numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee.
2. The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in the research committee is the average of the numbers of educationalists in the other two committees.
3. 60% of the politicians are in the administration committee, and 20% are in the teaching committee.

55. Based on the given information, which of the following statements MUST be FALSE?

A In the teaching committee the number of educationalists is equal to the number of politicians

B In the administration committee the number of bureaucrats is equal to the number of educationalists

C The size of the research committee is less than the size of the teaching committee

D The size of the research committee is less than the size of the administration committee

56. What is the number of bureaucrats in the administration committee?

57. What is the number of educationalists in the research committee?

58. Which of the following CANNOT be determined uniquely based on the given information?

A The size of the teaching committee

B The size of the research committee

C The total number of bureaucrats in the three committees

D The total number of educationalists in the three committees

Instructions [59 - 62]

1600 satellites were sent up by a country for several purposes. The purposes are classified as broadcasting (B), communication (C), surveillance (S), and others (O). A satellite can serve multiple purposes; however a satellite serving either B, or C, or S does not serve O. The following facts are known about the satellites:

1. The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1.
2. The number of satellites serving all three of B, C, and S is 100.
3. The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B.
4. The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

59. What best can be said about the number of satellites serving C?

A Must be at least 100

B Cannot be more than 800

C Must be between 450 and 725

D Must be between 400 and 800

60. What is the minimum possible number of satellites serving B exclusively?

A 250

B 100

C 500

D 200

61. If at least 100 of the 1600 satellites were serving O, what can be said about the number of satellites serving S?

A At most 475

B Exactly 475

C No conclusion is possible based on the given information

D At least 475

62. If the number of satellites serving at least two among B, C, and S is 1200, which of the following MUST be FALSE?

A The number of satellites serving B exclusively is exactly 250

B The number of satellites serving B is more than 1000

C The number of satellites serving C cannot be uniquely determined

D All 1600 satellites serve B or C or S

Instructions [63 - 66]

A company administers a written test comprising of three sections of 20 marks each - Data Interpretation (DI), Written English (WE) and General Awareness (GA), for recruitment. A composite score for a candidate (out of 80) is calculated by doubling her marks in DI and adding it to the sum of her marks in the other two sections. Candidates who score less than 70% marks in two or more sections are disqualified. From among the rest, the four with the highest composite scores are recruited. If four or less candidates qualify, all who qualify are recruited.

Ten candidates appeared for the written test. Their marks in the test are given in the table below. Some marks in the table are missing, but the following facts are known:

1. No two candidates had the same composite score.
2. Ajay was the unique highest scorer in WE.
3. Among the four recruited, Geeta had the lowest composite score.
4. Indu was recruited.
5. Danish, Harini, and Indu had scored the same marks the in GA.
6. Indu and Jatin both scored 100% in exactly one section and Jatin's composite score was 10 more than Indu's.

Candidate	Marks out of 20		
	DI	WE	GA
Ajay	8		16
Bala		9	11
Chetna	19	4	12
Danish	8	15	
Ester	12	18	16
Falak	15	7	10
Geeta	14		6
Harini	5		
Indu		8	
Jatin		16	14

63. Which of the following statements MUST be true?

1. Jatin's composite score was more than that of Danish.
2. Indu scored less than Chetna in DI.
3. Jatin scored more than Indu in GA.

A Both 2 and 3

B Only 1

C Only 2

D Both 1 and 2

64. Which of the following statements MUST be FALSE?

A Bala scored same as Jatin in DI

B Harini's composite score was less than that of Falak

C Bala's composite score was less than that of Ester

D Chetna scored more than Bala in DI

65. If all the candidates except Ajay and Danish had different marks in DI, and Bala's composite score was less than Chetna's composite score, then what is the maximum marks that Bala could have scored in DI?

66. If all the candidates scored different marks in WE then what is the maximum marks that Harini could have scored in WE?

Answers

LRDI

35.**C**	36.**B**	37.**D**	38.**C**	39.**7**	40.**6**	41.**A**	42.**A**
43.**4**	44.**4**	45.**A**	46.**D**	47.**D**	48.**C**	49.**D**	50.**B**
51.**C**	52.**B**	53.**A**	54.**B**	55.**C**	56.**4**	57.**3**	58.**A**
59.**C**	60.**A**	61.**A**	62.**C**	63.**D**	64.**A**	65.**13**	66.**14**

Explanations

LRDI

Explanation [35 - 38]:
There are 8 students in total - 4 male and 4 female. There are 3 institutes X, Y, and Z.
3 students are from institute X, 3 students are from institute Y, and 2 students are from institute Z. No student majors and minors in the same subject.

It has been given that both the students from institute Z are female. Also, it has been given that both the male students from institute Y minor in Finance. Therefore, the third student from institute Y should be female. Institute X should also have 2 male and 1 female student.

College	X			Y			Z	
Gender	M	M	F	M	M	F	F	F
Name								
Major								
Minor								

Both the male students from Y minor in Finance, while the female student from Y majors in Operations. Barun is from Y and majors in Operations. Chetan is from X and majors in Finance.

College	X			Y			Z	
Gender	M	M	F	M	M	F	F	F
Name	Chetan			Barun				
Major	Finance			Ops		Ops		
Minor				Finance	Finance			

It has been given that one female student and 2 male students major in finance. We know that the male student from Y minors in finance. Therefore, he cannot major in finance. Therefore, both the male students from X should major in finance.

Daisy and Amit are from the same institute. Therefore, Daisy cannot be from institute Z (since Amit is a male student and both the students from Z are female). Daisy minors in operations. The girl from institute Y majors in Operations. Therefore, Daisy cannot be from institute Y as well. Daisy and Amit should be from institute X. 3 female students minor in marketing. Therefore, all girls except Daisy should minor in marketing.

College	X			Y			Z	
Gender	M	M	F	M	M	F	F	F
Name	Chetan	Amit	Daisy	Barun				
Major	Finance	Finance		Ops		Ops		
Minor			Ops	Finance	Finance	Marketing	Marketing	Marketing

Adriana and Deb are from the same institute. Therefore, both of them should be from institute Y. Bandita and Chitra should be from institute Z.

Only one male student majors in Operations. We know that Barun is the student. Two male students major in Finance. We know that Amit and Chetan major in finance. Therefore, Deb should major in Marketing.

College	X			Y			Z	
Gender	M	M	F	M	M	F	F	F
Name	Chetan	Amit	Daisy	Barun	Deb	Adriana	Bandita	Chitra
Major	Finance	Finance		Ops	Marketing	Ops		
Minor			Ops	Finance	Finance	Marketing	Marketing	Marketing

35. **C**

Bandita and Chitra are from institute Z. Therefore, option C is the right answer.

36. **B**

Deb minors in Finance. Therefore, option B is the right answer.

37. **D**

Amit majors in finance. Therefore, option D is the right answer.

38. **C**

If Chitra majors in finance, Bandita cannot major in finance (only one female student majors in finance). She cannot major in marketing as well (since she has a minor degree in marketing). Therefore, Bandita should major in operations and hence, option C is the right answer.

39. **7**

It has been given that the customer gives 500 rupee notes as her preferred denomination.
Therefore, the number of 500 rupee notes dispensed must be greater than the number of the notes of other denominations dispensed.

If Rs.3500 is dispensed as 500 rupee notes (7 notes), the remaining 1500 rupees should be dispensed using Rs.100 and Rs.200 notes. The minimum number of notes of other denomination required in this case will be 8 (7*200 + 1*100). Therefore, at least Rs.4000 should be dispensed as 500 rupee notes.

Case (1):
Rs.4000 is dispensed using 500 rupee notes, 8 five hundred rupee notes will be dispensed.
The remaining 1000 rupees cannot be fully dispensed as 100 rupee notes (since 10 notes will be required).
If 800 rupees is dispensed as 100 rupee notes, then 9 notes will be required to dispense 1000 rupees (8*100+200).
Therefore, we can eliminate these 2 cases.
If 600 rupees is dispensed using 100 rupee notes, then a minimum of 8 notes will be required to dispense 1000 rupees (6*100 + 2*200). Therefore, we can eliminate this case as well.

If 400 rupees is dispensed using 100 rupee notes, then 7 notes will be required (4*100+3*200). This is a valid case.
If 200 rupees is dispensed using 100 rupee notes, then 6 notes will be required (2*100+4*200). This is a valid case.
1000 rupees can be dispensed using 5 notes of Rs.200.

Therefore, there are 3 valid cases.

Case (2):
Rs.4500 is dispensed using 500 rupee notes. 9 five hundred rupee notes will be dispensed in this case.
The remaining 500 rupees can be dispensed as 100 rupee notes (5 notes) or a combination of 100 rupee and 200 rupee notes.
200*a + 100*b = 500
'a' can take 0, 1, and 2.
Therefore, there are 3 valid cases.

Case (3):
5000 rupees is dispensed using 10 five hundred rupee notes.
There is only 1 valid case.

Total number of valid cases = 3+3+1 = 7.
Therefore, 7 is the right answer.

40. **6**
If a customer gives 500 rupee notes as her preferred denomination, the number of 500 rupee notes dispensed must be greater than the number of the notes of other denominations dispensed.
If Rs.3500 is dispensed as 500 rupee notes (7 notes), the remaining 1500 rupees should be dispensed using Rs.100 and Rs.200 notes. The minimum number of notes of other denomination required in this case will be 8 (7*200 + 1*100). Therefore, at least Rs.4000 should be dispensed as 500 rupee notes.

Case (1):
Rs.4000 is dispensed using 500 rupee notes, 8 five hundred rupee notes will be dispensed.
The remaining 1000 rupees cannot be fully dispensed as 100 rupee notes (since 10 notes will be required).
If 800 rupees is dispensed as 100 rupee notes, then 9 notes will be required to dispense 1000 rupees (8*100+200).
Therefore, we can eliminate these 2 cases.
If 600 rupees is dispensed using 100 rupee notes, then a minimum of 8 notes will be required to dispense 1000 rupees (6*100 + 2*200). Therefore, we can eliminate this case as well.

If 400 rupees is dispensed using 100 rupee notes, then 7 notes will be required (4*100+3*200). This is a valid case.
If 200 rupees is dispensed using 100 rupee notes, then 6 notes will be required (2*100+4*200). This is a valid case.
1000 rupees can be dispensed using 5 notes of Rs.200.

Therefore, there are 3 valid cases.

Case (2):
Rs.4500 is dispensed using 500 rupee notes. 9 five hundred rupee notes will be dispensed in this case.
The remaining 500 rupees can be dispensed as 100 rupee notes (5 notes) or a combination of 100 rupee and 200 rupee notes.
200*a + 100*b = 500
'a' can take 0, 1, and 2.
Therefore, there are 3 valid cases.

Case (3):
5000 rupees is dispensed using 10 five hundred rupee notes.
There is only 1 valid case.

It has been given that the ATM could serve only 10 customers with a stock of fifty 500 rupee notes. We have to find the maximum number of customers who could have given Rs.500 as their preference.
The least number of 500 rupee notes required to serve a customer who has given Rs.500 as the preference is 8.
Using 50 five hundred rupee notes, we can serve [50/8] = 6 customers. Therefore, 6 is the correct answer.

41. **A**

It has been given that the customer has to receive 20 notes at the maximum. Also, we have restriction on the number of 500 rupee notes (fifty) but we do not have any restriction on the number of notes of other denominations. Therefore, in order to serve the maximum number of customers, we have to minimize the number of 500 rupee notes dispensed as much as possible.

If no 500 rupee note is dispensed, then a minimum of 25 notes will be required (25 200 rupee notes).
If one 500 rupee note is dispensed, then a minimum of one 100 rupee note and twenty two 200 rupee notes will be required. The total number of notes required = 1 + 1 + 22 = 24. Therefore, we can eliminate this case.

If two 500 rupee notes are dispensed, then a minimum of 20 two hundred rupee notes will be required. We can eliminate this case as well since the number of notes required is greater than 20.

If three 500 rupee notes are dispensed, then a minimum of 1 hundred rupee note and 17 two hundred rupee notes will be required. The number of notes required in this case is 3+1+17 = 21. Therefore, we can eliminate this case as well.

If four 500 rupee notes are dispensed, then a minimum of 15 two hundred rupee notes will be required. Total number of notes required in this case is 4+15 = 19 < 20. Therefore, this is a valid case.

The least number of 500 rupee notes with which we can serve a customer such that the total number of notes dispensed does not exceed 20 is 4. Therefore, a maximum of [50/4] = 12 customers can be served with 50 five hundred rupee notes and hence, option A is the right answer.

42. **A**

It has been given that the total number of notes dispensed is the smallest possible. Therefore, we have to minimize the number of notes dispensed in each of the 2 cases given.

The least number of notes required to serve a customer who has given 500 rupees as his preference is 10.
50 customers who have given 500 rupee notes as their preference have to be served. We will require 50*10 = 500 notes for this purpose.

Let us consider the case when a customer has given Rs.100 as his preference.
As we have seen, minimum number of notes will be required when we maximize the number of five hundred rupee notes as much as possible.

If Rs.4000 is dispensed using 500 rupee notes, the remaining 1000 rupees can be dispensed using ten 100 rupee notes. In this case, the number of 100 rupee notes (10) is greater than the number of 500 rupee notes (8). This is a valid case. We have to find if we can reduce the number of notes required any further.

We cannot increase the number of 500 rupee notes to 9 since only 5 hundred rupee notes can be dispensed, violating the condition that the customer has given 100 as his preferred denomination.

If we replace two 100 rupee notes with one 200 rupee note, then the number of 100 rupee notes will become 6. The number of 500 rupee notes (8) exceeds the number of 100 rupee note (6). Therefore, dispensing 4000 rupees using 500 rupee notes and the rest using 100 rupee notes represents the optimum condition.

The minimum number of notes required to serve 1 customer = 8 (five hundred notes) + 10 (hundred notes) = 18
Number of five hundred notes required to serve 50 customers = 8*50 = 400

Therefore, the total number of notes required = 400 + 500 = 900.
Therefore, option A is the right answer.

43. **4**

Let us use 1 to denote the first number that we fill. We have to fill as many squares with 1 as possible. If we start with the top-left square, we can fill 4 squares with the number 1.

1		1
1		1

Now, we can fill number 2 only in 2 of the 5 squares available.

1	2	1
1	2	1

The 3 squares available now are adjacent to each other. Therefore, we will require at least 2 numbers to fill these squares.

1	2	1
3	4	3
1	2	1

We need a minimum of 4 numbers to fill a 3x3 square matrix such that no 2 adjacent cells contain the same number. Therefore, 4 is the correct answer.

44. **4**

Let us consider a 5x5 matrix. Let us start with the top left square and fill number 1 in as many squares as possible.

1		1		1
1		1		1
1		1		1

We have to use a second number, 2 to fill the gap between two 1s.

1	2	1	2	1
1	2	1	2	1
1	2	1	2	1

All the cells in row 2 and row 4 are adjacent to the cells containing numbers 1 and 2. Therefore, rows 2 and 4 should be filled with a new set of numbers. We need at least 2 numbers to fill a row such that the adjacent cells do not contain the same number (by alternating the numbers in the consecutive cells). Rows 2 and 4 are completely isolated from each other and hence, the same set of numbers can be used to fill both the rows.

1	2	1	2	1
3	4	3	4	3
1	2	1	2	1
3	4	3	4	3
1	2	1	2	1

As we can see, a minimum of 4 numbers are required to fill a 5x5 matrix. Therefore, 4 is the correct answer.

45. **A**

Let us consider a 5x5 matrix. Let us start with the top left square and fill number 1 in as many squares as possible.

1		1		1
1		1		1
1		1		1

We have to use a second number, 2 to fill the gap between two 1s.

1	2	1	2	1
1	2	1	2	1
1	2	1	2	1

All the cells in row 2 and row 4 are adjacent to the cells containing numbers 1 and 2. Therefore, rows 2 and 4 should be filled with a new set of numbers. We need at least 2 numbers to fill a row such that the adjacent cells do not contain the same number (by alternating the numbers in the consecutive cells). Rows 2 and 4 are completely isolated from each other and hence, the same set of numbers can be used to fill both the rows.

1	2	1	2	1
3	4	3	4	3
1	2	1	2	1
3	4	3	4	3
1	2	1	2	1

4 numbers are required to fill a 5x5 matrix.
It has been given that we are allowed to make 1 mistake - One pair of adjacent cells can contain the same number. In the arrangement given above, we can alter any value along the edge to satisfy this condition. For example, the 2 in the bottom-most row can be changed to 4. Still, the number of numbers required to fill the matrix will be 4.

Another way to approach this problem is as follows:
We know that a minimum of 4 numbers are required to fill a 5x5 matrix. If we are allowed to make a mistake, then the number of numbers required should either remain the same or go down. 4 is the smallest value among the given options. Therefore, we can be sure that even if we are allowed to make a mistake, 4 numbers will be required to fill the matrix and hence, option A is the right answer.

46. **D**
It has been given that all the cells adjacent to a cell must have different numerals. Let us start filling the matrix from the central square since the central square has the maximum number of squares adjacent to it (8) and it will be easier to work around the central 9 squares. A minimum of 9 numbers will be required to fill the central 9 squares.

	2	3	4	
	9	1	5	
	8	7	6	

Now we have to fill the remaining squares. Let us start with the top left square. We have to check whether the 9 numbers will be sufficient to fill all the squares such that no 2 squares adjacent to a square have the same number. We can use any of the 3 numbers 4, 5, and 6 to fill the top left square since none of the numbers in the second column are adjacent to these numbers.

Let us assume that we use 4 to fill the top left square. Now, one of the cells with the number 4 has become adjacent to the cell with number 2 and no other cell adjacent to cell with number 2 (in the second row and second column) can have 4 as its neighbour. Similarly, we can fill the first row with numbers 8 and 7.

4	7	8		
5	2	3	4	
6	9	1	5	
	8	7	6	

In essence, we are trying to create a gird around each of the numbers in the corners of the inner 3x3 matrix such that no 2 cells adjacent to a cell have the same number. Filling the other cells similarly, we get the following matrix as one of the possible cases.

4	7	8	6	7
5	2	3	4	9
6	9	1	5	2
3	8	7	6	8
2	5	4	3	9

We need a minimum of 9 numbers to fill a 5x5 matrix such that for any cell, no 2 cells adjacent to it contain the same value. Therefore, option D is the right answer.

47. **D**

Let us draw the table and fill all absolute information present.

Pumps	Contamination level
P1	
P2	
P3	
P4	
P5	
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

In statement 3, it is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded.

In statement 1, it is given that contamination levels at three pumps among P1 - P5 were recorded as high. This is only possible when pumps 1, 3 and 5 have high level of contamination. Also, P6 was the only pump among P1 - P10 where the contamination level was recorded as low. Therefore, we can say that pumps 2 and 4 have medium level of contamination.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that High contamination was recorded in only first 15 pumps. Therefore, we can say that the maximum number of pumps that can have high contamination level is '8'. (Consecutive pumps don't have same contamination level except one case)

Also, it is given that the number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded. Hence, we can say that the number of pumps that have high contamination level is an even number less than or equal to '8'.

If the number of high contamination level pumps is '6', then there will be only '3' pumps with low contamination level. Consequently, we will need 11 (20 - 6 - 3) pumps with medium contamination level which is not possible since the number of pumps of a single type can't exceed 10.(Consecutive pumps don't have same contamination level except one case)

Therefore, we can say that the number of pumps that have high contamination level = 8

The number of pumps that have low contamination level = 8/2 = 4

Also, the number of pumps that have medium contamination level = 20 - 8 - 4 = 12

It is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded. If P7 and P8 recorded medium contamination level then there can be at max 7 pumps (P1, P3, P5, P9, P11, P13, P15) with high contamination level. Hence, we can say that pumps P7 and P8 recorded High contamination level. Therefore, we can uniquely determine the contamination level till P10.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that these 5 pumps recorded low and medium contamination level. There are two cases possible.

Case 1: When there were 3 Low and 2 Medium contaminated level recorded in pumps P16 - P20.

3 Low contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Medium
P16	Low
P17	Medium
P18	Low
P19	Medium
P20	Low

Case 2: When there were 2 Low and 3 Medium contaminated level recorded in pumps P16 - P20.

3 Medium contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Low
P12	Medium
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	Low
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Low
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	Low
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Low
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Let us check the options one by one.

(Option:A) The contamination level at P20 was recorded as medium. This need not be true as we can see that in Case 1 at P20 low contamination level is recorded.

(Option:B) The contamination level at P13 was recorded as low. This need not be true as we can see that in Case 2(a), at P13 high contamination level is recorded.

(Option:C) The contamination level at P12 was recorded as high. This need not be true as we can see that in Case 2(a), at P12 medium contamination level is recorded.

(Option:D) The contamination level at P10 was recorded as high.. This is true for all cases. Hence, we can say that option D is the correct answer.

48. **C**

Let us draw the table and fill all absolute information present.

Pumps	Contamination level
P1	
P2	
P3	
P4	
P5	
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

In statement 3, it is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded.

In statement 1, it is given that contamination levels at three pumps among P1 - P5 were recorded as high. This is only possible when pumps 1, 3 and 5 have high level of contamination. Also, P6 was the only pump among P1 - P10 where the contamination level was recorded as low. Therefore, we can say that pumps 2 and 4 have

medium level of contamination.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that High contamination was recorded in only first 15 pumps. Therefore, we can say that the maximum number of pumps that can have high contamination level is '8'. (Consecutive pumps don't have same contamination level except one case)

Also, it is given that the number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded. Hence, we can say that the number of pumps that have high contamination level is an even number less than or equal to '8'.

If the number of high contamination level pumps is '6', then there will be only '3' pumps with low contamination level. Consequently, we will need 11 (20 - 6 - 3) pumps with medium contamination level which is not possible since the number of pumps of a single type can't exceed 10.(Consecutive pumps don't have same contamination level except one case)

Therefore, we can say that the number of pumps that have high contamination level = 8

The number of pumps that have low contamination level = 8/2 = 4

Also, the number of pumps that have medium contamination level = 20 - 8 - 4 = 12

It is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded. If P7 and P8 recorded medium contamination level then there can be at max 7 pumps (P1, P3, P5, P9, P11, P13, P15) with high contamination level. Hence, we can say that pumps P7 and P8 recorded High contamination level. Therefore, we can uniquely determine the contamination level till P10.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that these 5 pumps recorded low and medium contamination level. There are two cases possible.

Case 1: When there were 3 Low and 2 Medium contaminated level recorded in pumps P16 - P20.

3 Low contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Medium
P16	Low
P17	Medium
P18	Low
P19	Medium
P20	Low

Case 2: When there were 2 Low and 3 Medium contaminated level recorded in pumps P16 - P20.

3 Medium contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Low
P12	Medium
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	Low
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Low
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	Low
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Low
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

We know that medium contamination level was recorded at exactly 8 pumps. Hence, option C is the correct answer.

49. **D**

Let us draw the table and fill all absolute information present.

Pumps	Contamination level
P1	
P2	
P3	
P4	
P5	
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

In statement 3, it is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded.

In statement 1, it is given that contamination levels at three pumps among P1 - P5 were recorded as high. This is only possible when pumps 1, 3 and 5 have high level of contamination. Also, P6 was the only pump among P1 - P10 where the contamination level was recorded as low. Therefore, we can say that pumps 2 and 4 have medium level of contamination.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that High contamination was recorded in only first 15 pumps. Therefore, we can say that the maximum number of pumps that can have high contamination level is '8'. (Consecutive pumps don't have same contamination level except one case)

Also, it is given that the number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded. Hence, we can say that the number of pumps that have high contamination level is an even number less than or equal to '8'.

If the number of high contamination level pumps is '6', then there will be only '3' pumps with low contamination level. Consequently, we will need 11 (20 - 6 - 3) pumps with medium contamination level which is not possible since the number of pumps of a single type can't exceed 10.(Consecutive pumps don't have same contamination level except one case)

Therefore, we can say that the number of pumps that have high contamination level = 8

The number of pumps that have low contamination level = 8/2 = 4

Also, the number of pumps that have medium contamination level = 20 - 8 - 4 = 12

It is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded. If P7 and P8 recorded medium contamination level then there can be at max 7 pumps (P1, P3, P5, P9, P11, P13, P15) with high contamination level. Hence, we can say that pumps P7 and P8 recorded High contamination level. Therefore, we can uniquely determine the contamination level till P10.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that these 5 pumps recorded low and medium contamination level. There are two cases possible.

Case 1: When there were 3 Low and 2 Medium contaminated level recorded in pumps P16 - P20.

3 Low contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Medium
P16	Low
P17	Medium
P18	Low
P19	Medium
P20	Low

Case 2: When there were 2 Low and 3 Medium contaminated level recorded in pumps P16 - P20.

3 Medium contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Low
P12	Medium
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	Low
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Low
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	Low
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Low
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

We can see that in case 2(a) the contamination level at P11 was recorded as low. Let us check all the option one by one.

(Option : A) The contamination level at P12 was recorded as high. This statement is incorrect as we can see in the table, the contamination level at P12 was recorded as medium.

(Option : B) The contamination level at P15 was recorded as medium. This statement is incorrect as we can see in the table, the contamination level at P15 was recorded as High.

(Option : C) The contamination level at P18 was recorded as low. This statement is incorrect as we can see in the table, the contamination level at P18 was recorded as Medium.

(Option : D) The contamination level at P14 was recorded as medium. This statement is correct as we can see in the table, the contamination level at P14 was recorded as Medium. Hence, we can say that option D is the correct answer.

50. **B**

Let us draw the table and fill all absolute information present.

Pumps	Contamination level
P1	
P2	
P3	
P4	
P5	
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

In statement 3, it is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded.

In statement 1, it is given that contamination levels at three pumps among P1 - P5 were recorded as high. This is only possible when pumps 1, 3 and 5 have high level of contamination. Also, P6 was the only pump among P1 - P10 where the contamination level was recorded as low. Therefore, we can say that pumps 2 and 4 have medium level of contamination.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that High contamination was recorded in only first 15 pumps. Therefore, we can say that the maximum number of pumps that can have high contamination level is '8'. (Consecutive pumps don't have same contamination level except one case)

Also, it is given that the number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded. Hence, we can say that the number of pumps that have high contamination level is an even number less than or equal to '8'.

If the number of high contamination level pumps is '6', then there will be only '3' pumps with low contamination level. Consequently, we will need 11 (20 - 6 - 3) pumps with medium contamination level which is not possible since the number of pumps of a single type can't exceed 10.(Consecutive pumps don't have same contamination level except one case)

Therefore, we can say that the number of pumps that have high contamination level = 8

The number of pumps that have low contamination level = 8/2 = 4

Also, the number of pumps that have medium contamination level = 20 - 8 - 4 = 12

It is given that P7 and P8 were the only two consecutively numbered pumps where the same levels of contamination were recorded. If P7 and P8 recorded medium contamination level then there can be at max 7 pumps (P1, P3, P5, P9, P11, P13, P15) with high contamination level. Hence, we can say that pumps P7 and P8 recorded High contamination level. Therefore, we can uniquely determine the contamination level till P10.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	
P20	

It is given that High contamination levels were not recorded at any of the pumps P16 - P20. Therefore, we can say that these 5 pumps recorded low and medium contamination level. There are two cases possible.

Case 1: When there were 3 Low and 2 Medium contaminated level recorded in pumps P16 - P20.

3 Low contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Medium
P16	Low
P17	Medium
P18	Low
P19	Medium
P20	Low

Case 2: When there were 2 Low and 3 Medium contaminated level recorded in pumps P16 - P20.

3 Medium contamination level must have recorded in P16, P18 and P20. We can fill the table as follows.

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Low
P12	Medium
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	Low
P13	High
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Low
P14	Medium
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	Low
P15	High
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

Pumps	Contamination level
P1	High
P2	Medium
P3	High
P4	Medium
P5	High
P6	Low
P7	High
P8	High
P9	Medium
P10	High
P11	Medium
P12	High
P13	Medium
P14	High
P15	Low
P16	Medium
P17	Low
P18	Medium
P19	Low
P20	Medium

We can see that in case 1 the contamination level at P15 was recorded as medium. Let us check all the option one by one.

(Option :A) Contamination levels at P13 and P17 were recorded as the same. From the table, we can see that the contamination levels at P13 and P17 were recorded as medium. Hence, we can say that this statement is correct.

(Option :B) Contamination levels at P11 and P16 were recorded as the same. From the table, we can see that the contamination levels at P11 was recorded as Medium whereas at P16 it was recorded as Low. Hence, we can say that this statement is incorrect. Thus, option B is the correct answer.

Explanation [51 - 54]:
We have been given details about the quarterly sales figures. Also, we have been given details about the sales figures every month. Some of the data are missing and some additional conditions have been given in the question. Let us try to complete the pie chart as much as possible with the data available to us.

It is known that the sales figures during the three months of the second quarter (April, May, June) of 2016 form an arithmetic progression.
We know that the sales in April is 40.
Let the sales in May be 40+x and the sales in June be 40+2x.
We know that the total sales in Q2 is 150.
=> 40 + 40 + x + 40 + 2x = 150
3x = 30
x = 10

Therefore, sales in May 2016 = 40 + 10 = 50
Sales in June 2016 = 40 + 20 = 60

Similarly, it has been given that the sales in October, November, and December 2016 form an arithmetic progression.
Sales in October = 100
Sales in Q4 = 360

Let the sales in November be 100+y and the sales in December be 100+2y.
100 + 100 + y + 100 + 2y = 360
300 + 3y = 360
=> y = 20

Sales in November 2016 = 120 and Sales in December 2016 = 140
Sales in Q1 of 2016 = Sum of the sales in the months of January, February, and March 2016
= 80 + 60 + 100
= 240

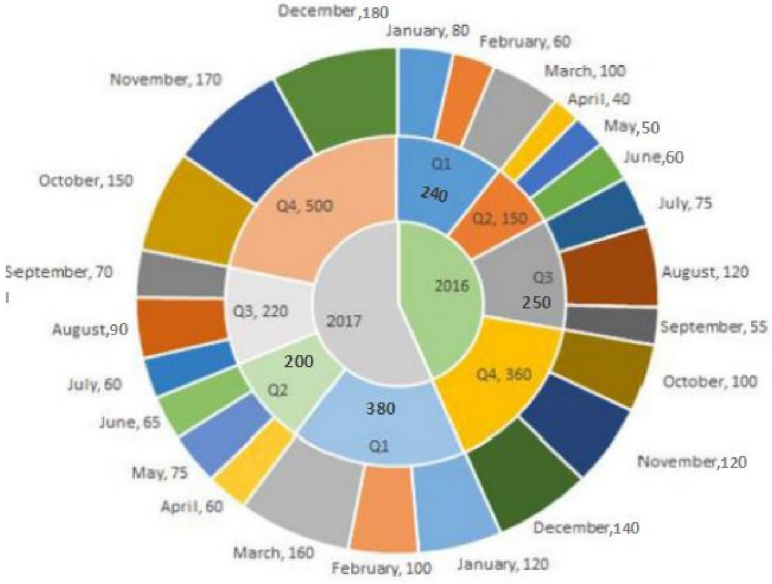
Sales in Q3 of 2016 = Sum of the sales in the months of July, August, and September 2016

= 75 + 120 + 55
= 250

Sales in Q1 of 2017 = 120 + 100 + 160 = 380
Sales in Q2 of 2017 = 65 + 75 + 60 = 200
We know that sales in Q3 of 2017 = 220

Let the sales in August of 2017 be ‘a’.
60 + 70 + a = 220
=> a = 90
Sales in August 2017 = 90
We know that sales in Q4 of 2017 = 500
Let the sales in December of 2017 be ‘d’.
150 + 170 + d = 500
=> d = 180

Sales in December 2017 = 180



51. **C**
Sales in December 2016 = 140
Sales in December 2017 = 180

Percentage change = (180-140)/140 = 40/140 = 28.57%

Therefore, option C is the right answer.

52. **B**

Among the given 4 options, we have to find the quarter in which the increase in sale from the previous quarter was the highest.
Q2:
Sales in 2017 = 200
Sales in 2016 = 150

Q1:
Sales in 2017 = 380
Sales in 2016 = 240

Q3:
Sales in 2017 = 220
Sales in 2016 = 250

Q4:
Sales in 2017 = 500
Sales in 2016 = 360

We can eliminate Q3 since the sales has decreased.
Growth in Q2 sales = 50/150 = 1/3 = 33.33%

Growth in Q1 sales = (380-240)/240 = 140/240 = 58.33%

Growth in Q4 sales = (500-360)/360 = 140/360

140/240 > 140/360

Therefore, Q1 has recorded the highest growth in sales and hence, option B is the right answer.

53. **A**
Q2 of 2017:

Sales in Q2 of 2017 = 200
Sales in Q1 of 2017 = 380
% decrease = 180/380

Q4 of 2017:
We can eliminate this option since the sales has increased in Q4 of 2017 as compared to the previous quarter.

Q2 of 2016:
Sales in Q2 of 2016 = 150
Sales in Q1 of 2016 = 240
% decrease = 90/240

Q1 of 2017:
Sales in Q1 of 2017 has increased as compared to sales in the previous quarter. We can eliminate this option as well.

180/380 is very close to 50%. 90/240 is closer to 33.33%. Therefore, option A is the right answer.

54. **B**

March of 2017:
Sales in March of 2017 = 160
Sales in February of 2017 = 100
% increase = 60/100 = 60%

October of 2017:
Sales in October of 2017 = 150
Sales in September of 2017 = 70
As we can see, the sales has increased by more than 100%.

March of 2016:
Sales in March of 2016 = 100
Sales in February of 2016 = 60
% increase in sales is less than 100%.

October of 2016:
Sales in October of 2016 = 100
Sales in September of 2016 = 55
% increase is less than 100%

As we can see, the percentage increase in sale as compared to the previous month was highest in October of 2017 among the given options. Therefore, option B is the right answer.

55. **C**
Let us draw a table according to the information given.

	Research	Teaching	Administration	Total
Bureaucrats				
Educationalists				
Politicians				
Total				24

It is given that the numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee. Let '4x' be the number of bureaucrats in Administration committee.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists				
Politicians				
Total				24

The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in the research committee is the average of the numbers of educationalists in the other two committees. Let us assume that 'y' is the number of educationalists in the research committee and 'd' be the difference in the number of educationalists in Research and teaching committees.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists	y	y-d	y+d	3y
Politicians				
Total				24

60% of the politicians are in the administration committee, and 20% are in the teaching committee. Let '5z' be the number of total number of politicians.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists	y	y-d	y+d	3y
Politicians	z	z	3z	5z
Total				24

We can say that

$\Rightarrow 10x+3y+5z = 24$

We can see that each of x, y and z has to a natural number integer. If x > 1, then both y and z can't take any natural number.

Hence, we can say that x = 1.

At x = 1, 3y+5z = 14. If y = 1 or 2, Z is not an integer.

At x = 1 and y = 3, z = 1 which is the only possible solution.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	3-d	3+d	9
Politicians	1	1	3	5
Total				24

We can see that 'd' can assume two possible values. d = 1 or 2.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	2/1	4/5	9
Politicians	1	1	3	5
Total	7	6/5	11/12	24

Let us check the option one by one.

Option A: In the teaching committee the number of educationalists is equal to the number of politicians. We can see that in the teaching committee the number of educationalists can be equal to the number of politicians when both the numbers are '1'. Hence, this statement can be correct.

Option B: In the administration committee the number of bureaucrats is equal to the number of educationalists. We can see that in the administration committee the number of bureaucrats can be equal to the number of educationalists when both the numbers are '4'. Hence, this statement can be correct.

Option C: The size of the research committee is less than the size of the teaching committee. We can see the maximum size of teaching committee can be '6' which is less than the size of the research committee. Hence, the sentence is incorrect.

Option D: The size of the research committee is less than the size of the administration committee. We can see the minimum size of Administration committee can be '11' which is more than the size of the research committee. Hence, this statement is correct.

Therefore, we can say that option C is the correct answer.

56. **4**

Let us draw a table according to the information given.

	Research	Teaching	Administration	Total
Bureaucrats				
Educationalists				
Politicians				
Total				24

It is given that the numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee. Let '4x' be the number of bureaucrats in Administration committee.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists				
Politicians				
Total				24

The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in the research committee is the average of the numbers of educationalists in the other two committees. Let us assume that 'y' is the number of educationalists in the research committee and 'd' be the difference in the number of educationalists in Research and teaching committees.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists	y	y-d	y+d	3y
Politicians				
Total				24

60% of the politicians are in the administration committee, and 20% are in the teaching committee. Let '5z' be the number of total number of politicians.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists	y	y-d	y+d	3y
Politicians	z	z	3z	5z
Total				24

We can say that

$\Rightarrow$ 10x+3y+5z = 24

We can see that each of x, y and z has to a natural number integer. If x > 1, then both y and z can't take any natural number.

Hence, we can say that x = 1.

At x = 1, 3y+5z = 14. If y = 1 or 2, Z is not an integer.

At x = 1 and y = 3, z = 1 which is the only possible solution.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	3-d	3+d	9
Politicians	1	1	3	5
Total				24

We can see that 'd' can assume two possible values. d = 1 or 2.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	2/1	4/5	9
Politicians	1	1	3	5
Total	7	6/5	11/12	24

From the table, we can see that the number of bureaucrats in the administration committee = 4.

57. **3**

Let us draw a table according to the information given.

	Research	Teaching	Administration	Total
Bureaucrats				
Educationalists				
Politicians				
Total				**24**

It is given that the numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee. Let '4x' be the number of bureaucrats in Administration committee.

	Research	Teaching	Administration	Total
Bureaucrats	**3x**	**3x**	**4x**	**10x**
Educationalists				
Politicians				
Total				**24**

The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in the research committee is the average of the numbers of educationalists in the other two committees. Let us assume that 'y' is the number of educationalists in the research committee and 'd' be the difference in the number of educationalists in Research and teaching committees.

	Research	Teaching	Administration	Total
Bureaucrats	**3x**	**3x**	**4x**	**10x**
Educationalists	**y**	**y-d**	**y+d**	**3y**
Politicians				
Total				**24**

60% of the politicians are in the administration committee, and 20% are in the teaching committee. Let '5z' be the number of total number of politicians.

	Research	Teaching	Administration	Total
Bureaucrats	**3x**	**3x**	**4x**	**10x**
Educationalists	**y**	**y-d**	**y+d**	**3y**
Politicians	**z**	**z**	**3z**	**5z**
Total				**24**

We can say that

$\Rightarrow 10x+3y+5z = 24$

We can see that each of x, y and z has to a natural number integer. If x > 1, then both y and z can't take any natural number.

Hence, we can say that x = 1.

At x = 1, 3y+5z = 14. If y = 1 or 2, Z is not an integer.

At x = 1 and y = 3, z = 1 which is the only possible solution.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	3-d	3+d	9
Politicians	1	1	3	5
Total				24

We can see that 'd' can assume two possible values. d = 1 or 2.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	2/1	4/5	9
Politicians	1	1	3	5
Total	7	6/5	11/12	24

From the table, we can see that the number of educationalists in the research committee = 3.

58. **A**

Let us draw a table according to the information given.

	Research	Teaching	Administration	Total
Bureaucrats				
Educationalists				
Politicians				
Total				24

It is given that the numbers of bureaucrats in the research and teaching committees are equal, while the number of bureaucrats in the research committee is 75% of the number of bureaucrats in the administration committee. Let '4x' be the number of bureaucrats in Administration committee.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists				
Politicians				
Total				24

The number of educationalists in the teaching committee is less than the number of educationalists in the research committee. The number of educationalists in the research committee is the average of the numbers of educationalists in the other two committees. Let us assume that 'y' is the number of educationalists in the research committee and 'd' be the difference in the number of educationalists in Research and teaching committees.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists	y	y-d	y+d	3y
Politicians				
Total				24

60% of the politicians are in the administration committee, and 20% are in the teaching committee. Let '5z' be the number of total number of politicians.

	Research	Teaching	Administration	Total
Bureaucrats	3x	3x	4x	10x
Educationalists	y	y-d	y+d	3y
Politicians	z	z	3z	5z
Total				24

We can say that

$\Rightarrow$ 10x+3y+5z = 24

We can see that each of x, y and z has to a natural number integer. If x > 1, then both y and z can't take any natural number.

Hence, we can say that x = 1.

At x = 1, 3y+5z = 14. If y = 1 or 2, Z is not an integer.

At x = 1 and y = 3, z = 1 which is the only possible solution.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	3-d	3+d	9
Politicians	1	1	3	5
Total				24

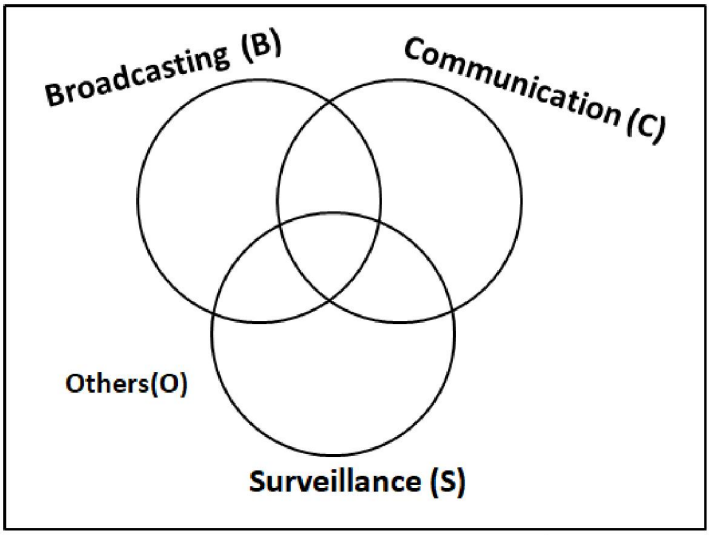
We can see that 'd' can assume two possible values. d = 1 or 2.

	Research	Teaching	Administration	Total
Bureaucrats	3	3	4	10
Educationalists	3	2/1	4/5	9
Politicians	1	1	3	5
Total	7	6/5	11/12	24

From the table, we can not uniquely determine the size of the teaching committee. Hence, option A is the correct answer.

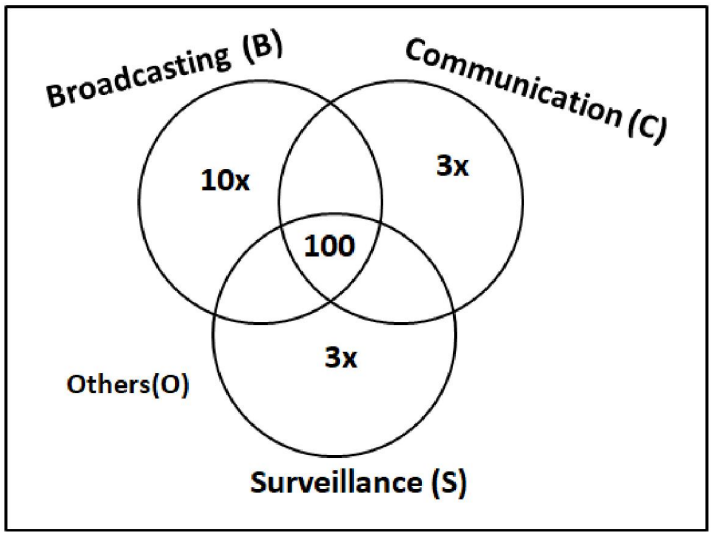
Explanation [59 - 62]:
It is given that a satellite serving either B, or C, or S does not serve O. So we can say that it's basically 3 satellites broadcasting (B), communication (C), surveillance (S) which can have intersections. Those satellites which are not part of any category are placed in others. We can draw the Venn diagram as follows.

59. **C**

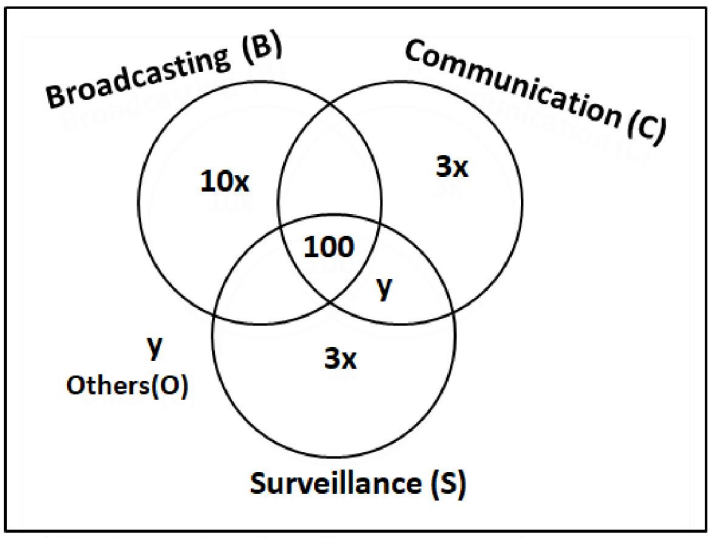


1. The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1.
2. The number of satellites serving all three of B, C, and S is 100.
3. The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B.
4. The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

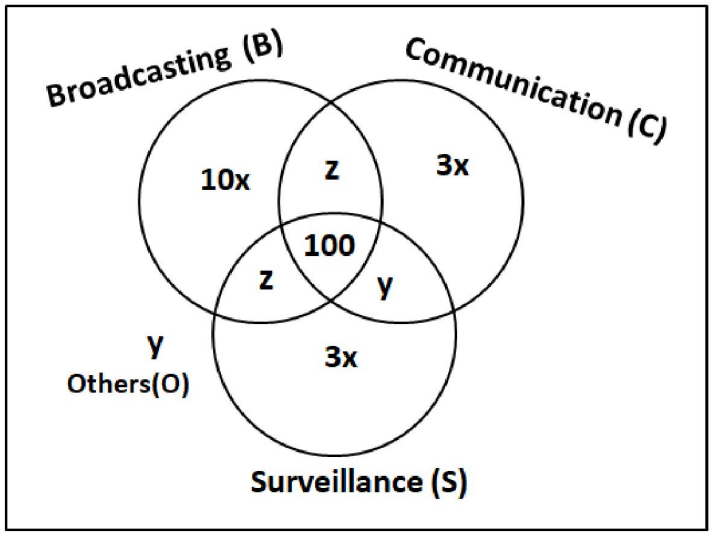
Let '10x' be the number of satellites exclusively serving B. Then, the number of satellites exclusively serving C and S = 0.30*10x = 3x



Let 'y' be the number of satellites serving others(O).



Let 'z' be the number of satellites serving B, C but not S. Since the numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. Therefore, we can can say that number of satellites serving B, S but not C = z.



It is given that

$\Rightarrow$ 10x+2z+2y+6x+100 = 1600

$\Rightarrow$ 8x+z+y = 750 ... (1)

The numbers of satellites serving B, C, and S (though maybe not exclusively) are in the ratio 2:1:1.

$$\Rightarrow \frac{10x + 2z + 100}{z + 100 + 3x + y} = \frac{2}{1}$$

$$\Rightarrow 10x + 2z + 100 = 2(z + 100 + 3x + y)$$

$$\Rightarrow 4x = 100 + 2y$$

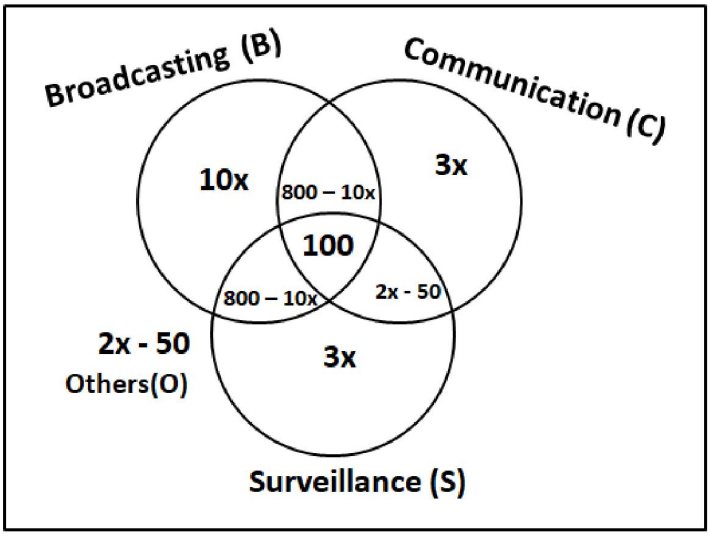
$$\Rightarrow 2x = 50 + y$$

$$\Rightarrow y = 2x - 50 \quad \text{... (2)}$$

We can substitute this in equation (1)

$\Rightarrow$ 8x+z+2x - 50 = 750

$\Rightarrow$ z = 800 - 10x ... (3)



Let us define boundary condition for x,

$\Rightarrow$ 2x - 50 $\geq$ 0

$\Rightarrow$ x $\geq$ 25

Also, 800 - 10x $\geq$ 0

$\Rightarrow$ x $\leq$ 80

Therefore, we can say that x ϵ [25, 80].

The number of satellites serving C = 800 - 10x + 100 + 3x + 2x - 50 = 850 - 5x

At x = 25, The number of satellites serving C = 850 - 5x = 850 - 5*25 = 725

At x = 80, The number of satellites serving C = 850 - 5x = 850 - 5*80 = 450

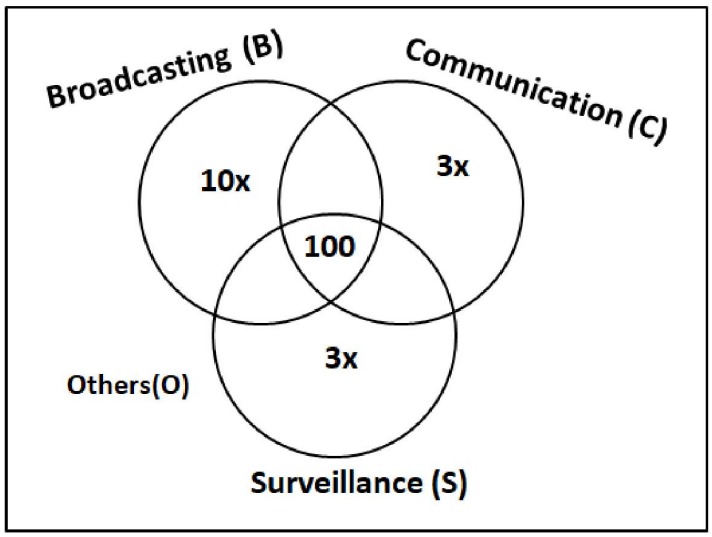
Hence, we can say that the number of satellites serving C must be between 450 and 725. Hence, option C is the correct answer.

60. **A**

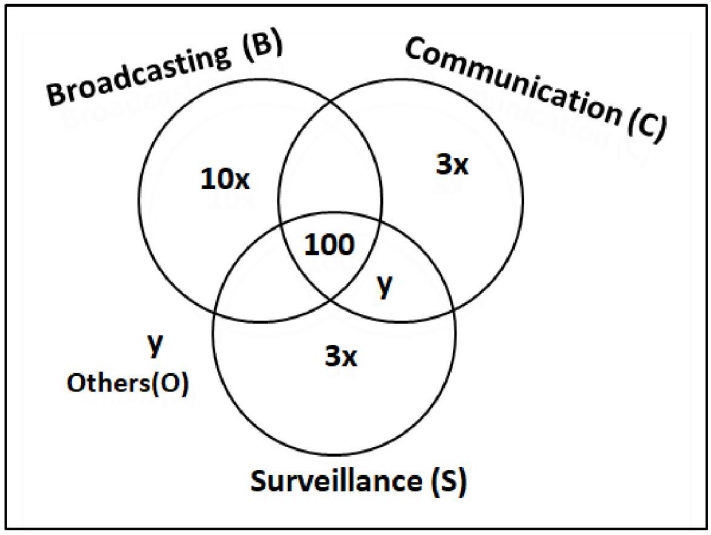
It is given that a satellite serving either B, or C, or S does not serve O. So we can say that it's basically 3 satellites broadcasting (B), communication (C), surveillance (S) which can have intersections. Those satellites which are not part of any category are placed in others. We can draw the Venn diagram as follows.

1. The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. 2. The number of satellites serving all three of B, C, and S is 100. 3. The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B. 4. The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

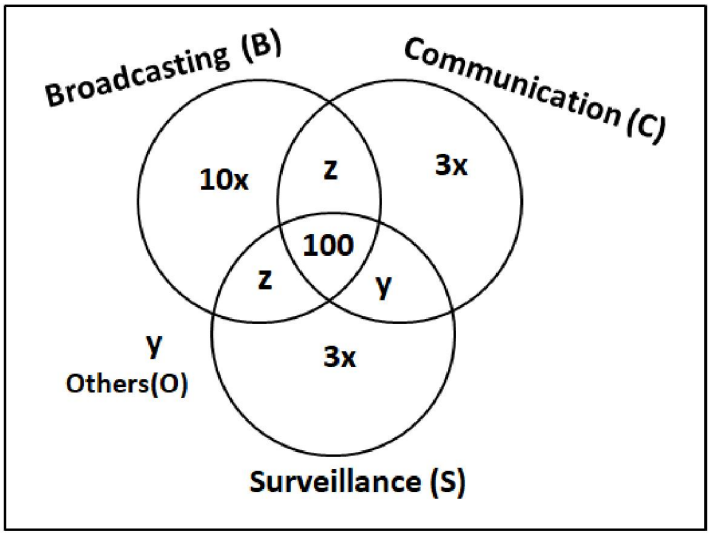
Let '10x' be the number of satellites exclusively serving B. Then, the number of satellites exclusively serving C and S = 0.30*10x = 3x



Let 'y' be the number of satellites serving others(O).



Let 'z' be the number of satellites serving B, C but not S. Since the numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. Therefore, we can can say that number of satellites serving B, S but not C = z.



It is given that

$\Rightarrow$ 10x+2z+2y+6x+100 = 1600

$\Rightarrow$ 8x+z+y = 750 ... (1)

The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1.

$$\Rightarrow \frac{10x + 2z + 100}{z + 100 + 3x + y} = \frac{2}{1}$$

$$\Rightarrow 10x + 2z + 100 = 2(z + 100 + 3x + y)$$

$$\Rightarrow 4x = 100 + 2y$$

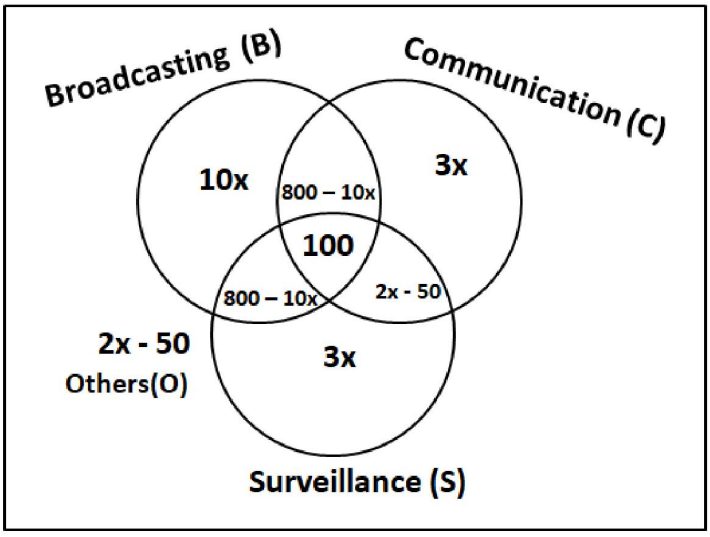
$$\Rightarrow 2x = 50 + y$$

$$\Rightarrow y = 2x - 50 \quad \text{... (2)}$$

We can substitute this in equation (1)

$\Rightarrow$ 8x+z+2x - 50 = 750

$\Rightarrow$ z = 800 - 10x ... (3)



Let us define boundary condition for x,

$\Rightarrow$ 2x - 50 $\geq$ 0

$\Rightarrow$ x $\geq$ 25

Also, 800 - 10x $\geq$ 0

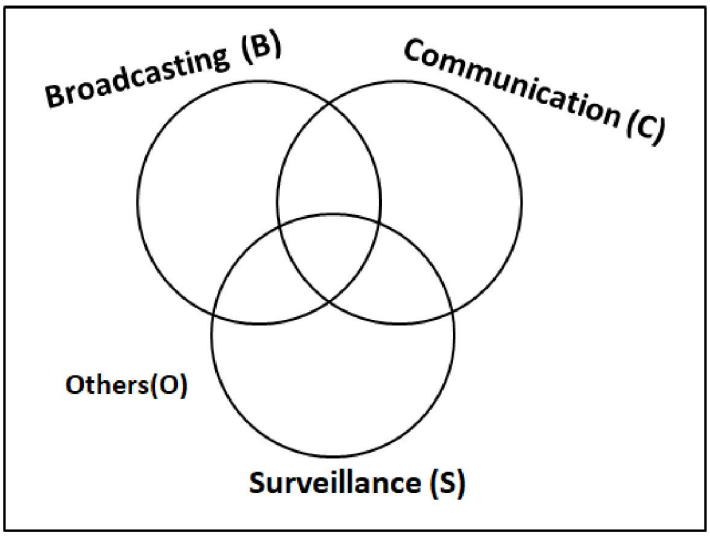
$\Rightarrow$ x $\leq$ 80

Therefore, we can say that x ϵ [25, 80].

The number of satellites serving B exclusively = 10x. This will be the minimum when 'x' is the minimum.

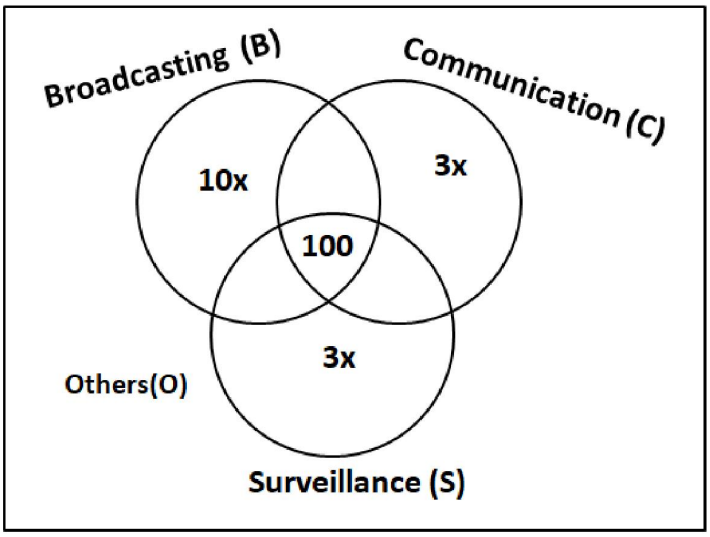
At x_{min} = 25, The number of satellites serving B exclusively = 10*25 =250. Hence, option A is the correct answer.

61. **A**

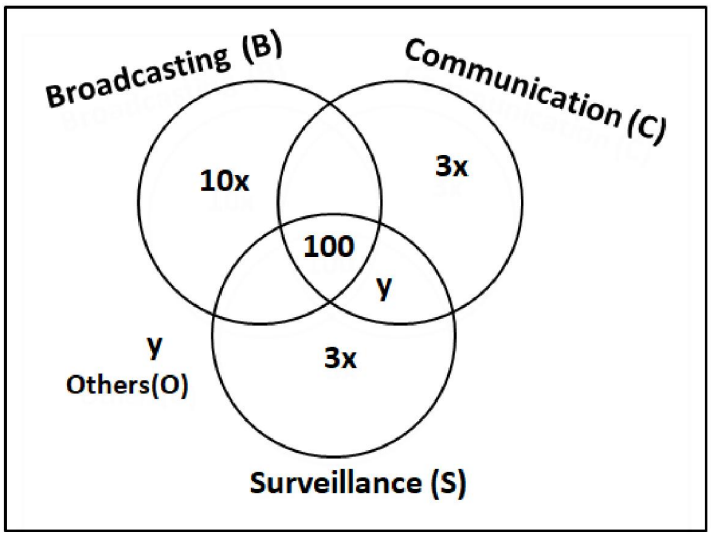


1. The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. 2. The number of satellites serving all three of B, C, and S is 100. 3. The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B. 4. The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

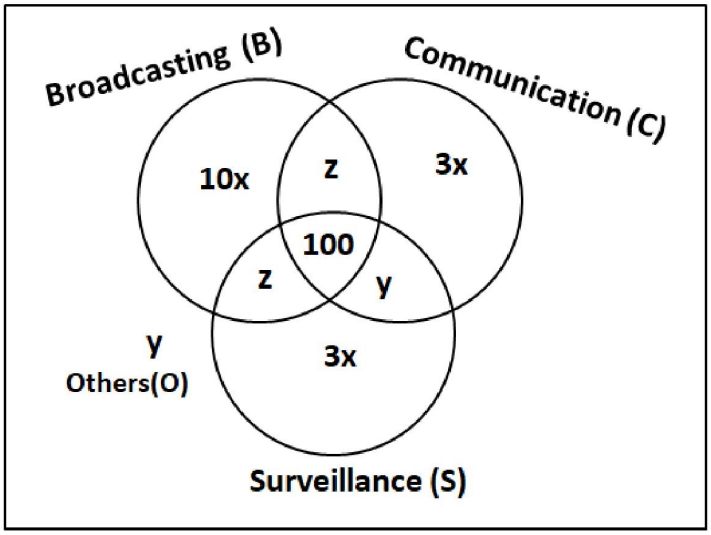
Let '10x' be the number of satellites exclusively serving B. Then, the number of satellites exclusively serving C and S = 0.30*10x = 3x



Let 'y' be the number of satellites serving others(O).



Let 'z' be the number of satellites serving B, C but not S. Since the numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. Therefore, we can can say that number of satellites serving B, S but not C = z.



It is given that

$\Rightarrow$ 10x+2z+2y+6x+100 = 1600

$\Rightarrow$ 8x+z+y = 750 ... (1)

The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1.

$$\Rightarrow \frac{10x + 2z + 100}{z + 100 + 3x + y} = \frac{2}{1}$$

$$\Rightarrow 10x + 2z + 100 = 2(z + 100 + 3x + y)$$

$$\Rightarrow 4x = 100 + 2y$$

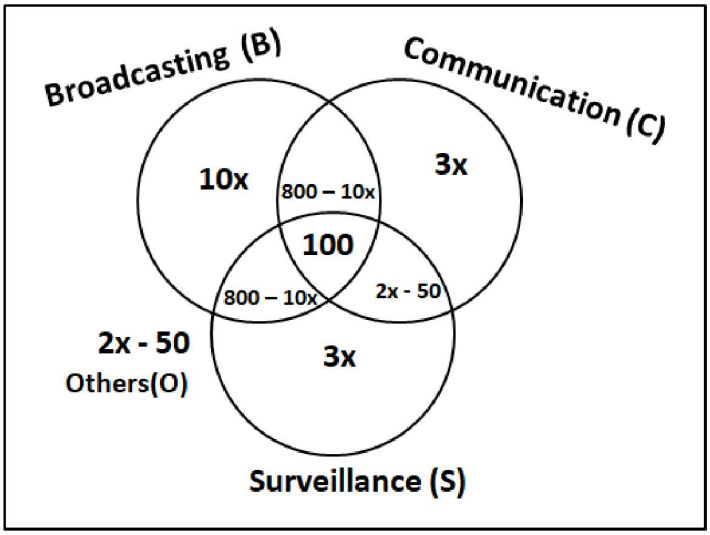
$$\Rightarrow 2x = 50 + y$$

$$\Rightarrow y = 2x - 50 \quad \text{... (2)}$$

We can substitute this in equation (1)

$\Rightarrow$ 8x+z+2x - 50 = 750

$\Rightarrow$ z = 800 - 10x ... (3)



Let us define boundary condition for x,

$\Rightarrow$ 2x - 50 $\geq$ 0

$\Rightarrow$ x $\geq$ 25

Also, 800 - 10x $\geq$ 0

$\Rightarrow$ x $\leq$ 80

Therefore, we can say that x ϵ [25, 80].

It is given that at least 100 of the 1600 satellites were serving O.

$\Rightarrow$ 2x - 50 $\geq$ 100

$\Rightarrow$ x $\geq$ 75

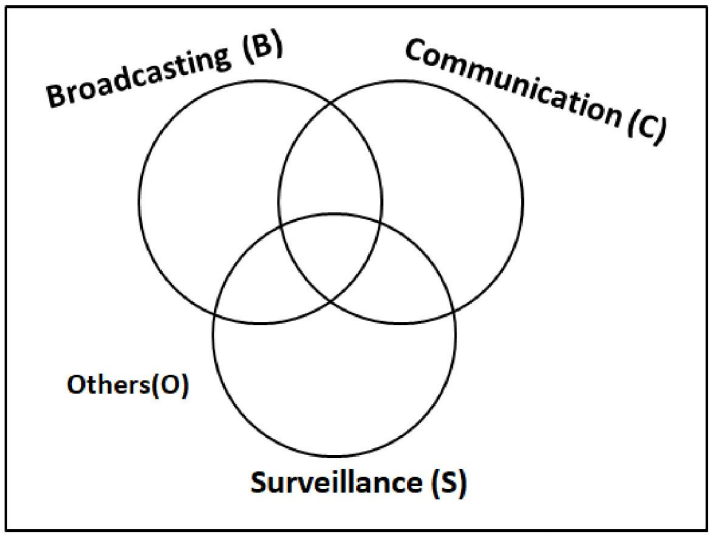
The number of satellites serving S = 100 + 800 - 10x + 2x - 50 + 3x = 850 - 5x

At x_{min} = 75, the number of satellites serving S = 850 - 5*75 = 475

At x_{max} = 80, the number of satellites serving S = 850 - 5*80 = 450

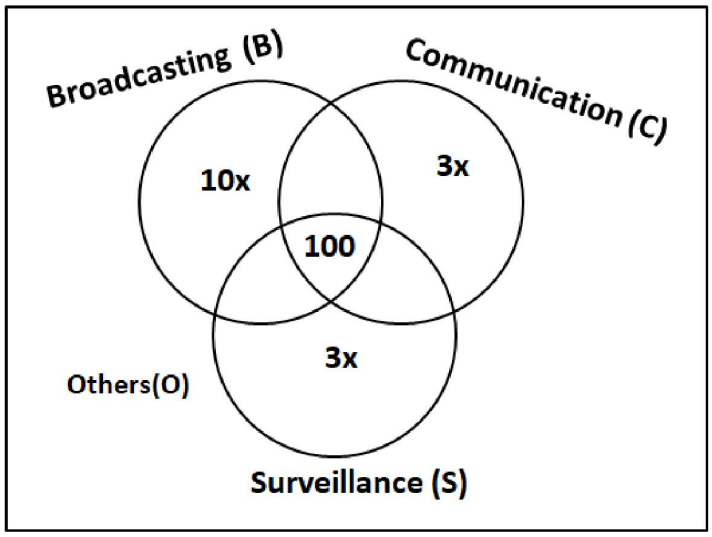
Hence, we can say that the number of satellites serving S must be from 425 to 475. Therefore, we can say that option A is the correct answer.

62. **C**

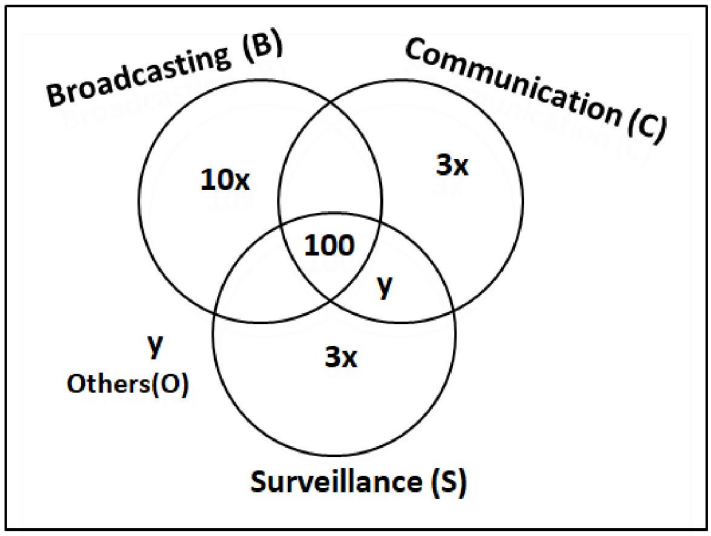


1. The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. 2. The number of satellites serving all three of B, C, and S is 100. 3. The number of satellites exclusively serving C is the same as the number of satellites exclusively serving S. This number is 30% of the number of satellites exclusively serving B. 4. The number of satellites serving O is the same as the number of satellites serving both C and S but not B.

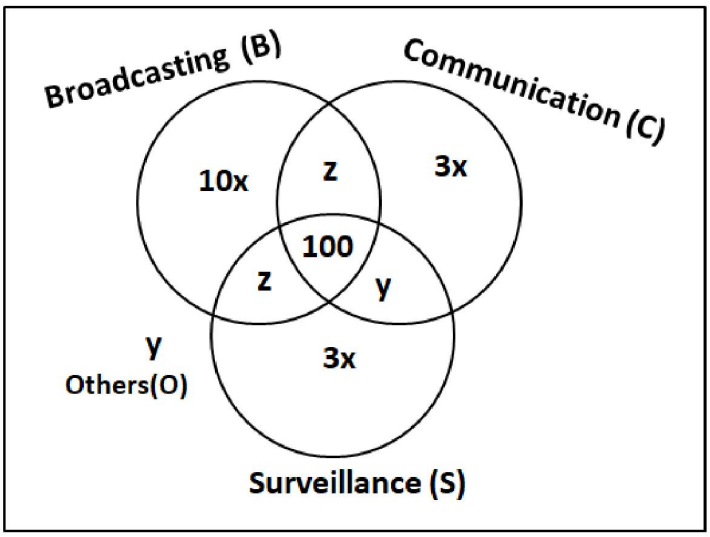
Let '10x' be the number of satellites exclusively serving B. Then, the number of satellites exclusively serving C and S = 0.30*10x = 3x



Let 'y' be the number of satellites serving others(O).



Let 'z' be the number of satellites serving B, C but not S. Since the numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1. Therefore, we can can say that number of satellites serving B, S but not C = z.



It is given that

$\Rightarrow$ 10x+2z+2y+6x+100 = 1600

$\Rightarrow$ 8x+z+y = 750 ... (1)

The numbers of satellites serving B, C, and S (though may be not exclusively) are in the ratio 2:1:1.

$$\Rightarrow \frac{10x + 2z + 100}{z + 100 + 3x + y} = \frac{2}{1}$$

$$\Rightarrow 10x + 2z + 100 = 2(z + 100 + 3x + y)$$

$$\Rightarrow 4x = 100 + 2y$$

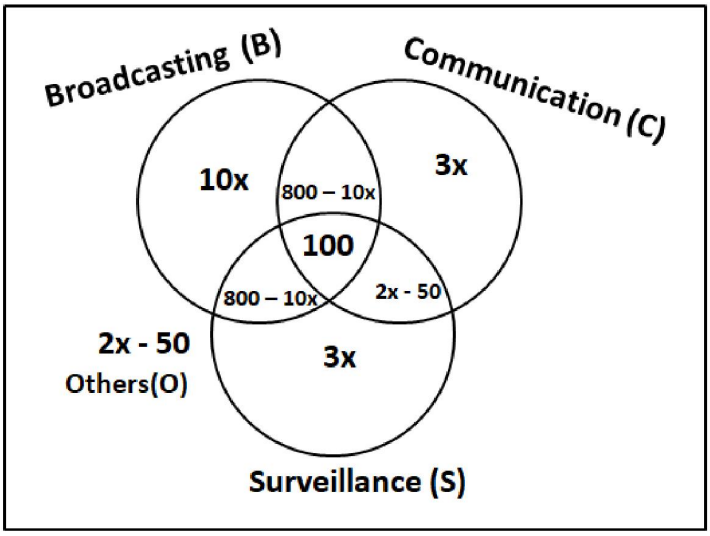
$$\Rightarrow 2x = 50 + y$$

$$\Rightarrow y = 2x - 50 \quad \text{... (2)}$$

We can substitute this in equation (1)

$\Rightarrow$ 8x+z+2x - 50 = 750

$\Rightarrow$ z = 800 - 10x ... (3)



Let us define boundary condition for x,

$\Rightarrow$ 2x - 50 $\geq$ 0

$\Rightarrow$ x $\geq$ 25

Also, 800 - 10x $\geq$ 0

$\Rightarrow$ x $\leq$ 80

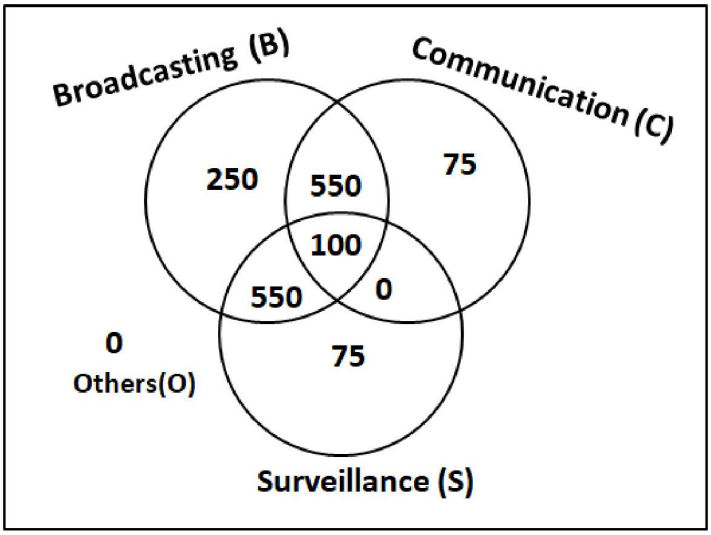
Therefore, we can say that x ϵ [25, 80].

It is given that the number of satellites serving at least two among B, C, and S is 1200.

$\Rightarrow$ 800 - 10x + 800 - 10x + 2x -50 + 100 = 1200

$\Rightarrow$ 18x = 450

$\Rightarrow$ x = 25



We can determine number of satellites in each of the following category. Hence, option C is definitely false. Therefore, we can say that option C is incorrect.

Explanation [63 - 66]:

It is given that Indu and Jatin both scored 100% in exactly one section. We can say that Jatin scored 100% marks in DI. Therefore, Jatin's composite score = 2*20+16+14 = 70

It is given that Jatin's composite score was 10 more than Indu's. Therefore, we can say that Indu's composite score = 70 - 10 = 60.

Indu also scored 100% in exactly one section.

Case 1: Indu scored 100% marks in DI.

If Indu scored 100% marks in DI, then Indu's score in GA = 60 - 2*20 - 8 = 12 which is less than 70% of maximum possible marks. Indu already has less than 70% in WE, therefore we Indu can't be recruited . Hence, we can reject this case.

Consequently, we can say that Indu scored 100% marks in WE. Therefore, Indu's score in DI = $\frac{60-8-20}{2}$ = 16

It is also given that Danish, Harini, and Indu had scored the same marks the in GA.

Candidate	Marks out of 20			Composite score
	DI	WE	GA	
Ajay	8		16	52
Bala		9	11	
Chetna	19	4	12	54
Danish	8	15	20	51
Ester	12	18	16	58
Falak	15	7	10	47
Geeta	14		6	
Harini	5		20	
Indu	16	8	20	60
Jatin	20	16	14	70

We are given that, among the four recruited, Geeta had the lowest composite score.

Maximum composite score that Geeta can get = 2*14 + 6 + 20 = 54 {Assuming 100% marks in WE}. Since, Geeta was recruitedat a composite score of 54 or less we can say that Ester was definitely recruited.

It is given that no two candidates had the same composite score. We can see that Chetna's composite score is 54. Hence, Geeta can't have a composite score of 54. Therefore, we can say that Geeta's composite score is 53 or less.

We already know the four people(Jatin, Indu, Geeta, Ester) which were recruited. Hence, we cab say that Danish was rejected at a composite score of 51. Hence, we can say that Geeta's composite score in 52 or more.

Consequently, we can say that Geeta's composite score if either 52 or 53. Therefore we can say that Geeta scored either 18 {52-(2*14+6)} or 19 {53-(2*14+6)} marks in WE.

Candidate	Marks out of 20			Composite score
	DI	WE	GA	
Ajay	8		16	52
Bala		9	11	
Chetna	19	4	12	54
Danish	8	15	20	51
Ester	12	18	16	58
Falak	15	7	10	47
Geeta	14	18/19	6	52/53
Harini	5		20	
Indu	16	8	20	60
Jatin	20	16	14	70

Ajay was the unique highest scorer in WE.

Case 1: Geeta scored 19 marks in WE.

We can say that if Geeta scored 19 marks in WE, then Ajay scored 20 marks in DI. In that case Ajay's composite score = 2*8 + 20 + 16 = 52. Which is a possible case.

Case 1: Geeta scored 18 marks in WE.

We can say that if Geeta scored 18 marks in WE, then Ajay can score either 19 or 20 marks in DI.

If Ajay scored 20 marks in DI then in that case Ajay's composite score = 2*8 + 20 + 16 = 52 which will be same as Geeta's composite score. Hence, we can say that in this case Ajay can't score 20 marks.

If Ajay scored 19 marks in DI then in that case Ajay's composite score = 2*8 + 19 + 16 = 51 which will be same as Danish's composite score. Hence, we can say that in this case Ajay can't score 19 marks.

Therefore, we can say that case 2 is not possible at all.

Candidate	Marks out of 20			Composite score
	DI	WE	GA	
Ajay	8	20	16	52
Bala		9	11	
Chetna	19	4	12	54
Danish	8	15	20	51
Ester	12	18	16	58
Falak	15	7	10	47
Geeta	14	19	6	53
Harini	5		20	
Indu	16	8	20	60
Jatin	20	16	14	70

63. **D**

Let us check all the statement one by one.

Statement 1: Jatin's composite score was more than that of Danish. We can see that this statement is correct.
Statement 2: Indu scored less than Chetna in DI. We can see that Indu scored 16 marks in DI whereas Chetna scored 19 marks in DI. Hence, we can say that this statement is also correct.
Statement 3: Jatin scored more than Indu in GA. We can see that Jatin scored 14 marks in GA whereas Indu scored 20 marks in GA. Hence, we can say that this statement is incorrect.

Hence, we can say that option D is the correct answer.

64. **A**

Let us check all the statement one by one.

Option A: Bala scored same as Jatin in DI. We can say that Bala scored 20 marks in DI. In that Bala's composite score = 2*20 + 9 + 11 = 60 which is sam as Indu's composite score. Therefore, we can say that this is a false statement. Hence, option A is the correct answer.

65. **13**

It is given that all the candidates except Ajay and Danish had different marks in DI and Bala's composite score was less than Chetna's composite score.

Let us assume that Bala scored 'x' marks in DI.

$\Rightarrow 2*x + 9 + 11 < 54$

$\Rightarrow x < 17$

We can see that Bala's score will be less than 17. Bala's maximum score in DI will be the largest possibel number less than 17 which is not same as any other candidate's score in DI. From, the table we can see that 16, 15 and 14 are already taken by Indu, Falak and Geeta respectively.

Therefore, we can say that Bala can score a maximum of 13 marks in DI.

66. **14**

Ajay was the unique highest scorer in WE.

Case 1: Geeta scored 19 marks in WE.

We can say that if Geeta scored 19 marks in WE, then Ajay scored 20 marks in DI. In that case Ajay's composite score = 2*8 + 20 + 16 = 52. Which is a possible case.

Case 1: Geeta scored 18 marks in WE.

We can say that if Geeta scored 18 marks in WE, then Ajay can score either 19 or 20 marks in DI.

If Ajay scored 20 marks in DI then in that case Ajay's composite score = 2*8 + 20 + 16 = 52 which will be same as Geeta's composite score. Hence, we can say that in this case Ajay can't score 20 marks.

If Ajay scored 19 marks in DI then in that case Ajay's composite score = 2*8 + 19 + 16 = 51 which will be same as Danish's composite score. Hence, we can say that in this case Ajay can't score 19 marks.

Therefore, we can say that case 2 is not possible at all.

Candidate	Marks out of 20			Composite score
	DI	WE	GA	
Ajay	8	20	16	52
Bala		9	11	
Chetna	19	4	12	54
Danish	8	15	20	51
Ester	12	18	16	58
Falak	15	7	10	47
Geeta	14	19	6	53
Harini	5		20	
Indu	16	8	20	60
Jatin	20	16	14	70

It is given that all the candidates scored different marks in WE.

We can see that Ajay, Geeta and Ester has already scored 20, 19 and 18 marks in WE. Therefore, Harini can score a maximum of 17 marks in WE. If Harini's score in WE is 17, then Harini's composite score = 2*5+17+20 = 47 which is same as Falak's composite score. Hence, we can say that Harini can't score 17 marks in WE. Jatin and Danish have already scored 16 and 15 marks respectively.

Therefore, we can say that the maximum marks that Harini could have scored in WE = 14.