

distinct rating points in Hygiene from the four customers adding up to 26 points.

3. Chirag gave the same rating points for Packaging and Hygiene.

4. Among the four customers, Bihari gave the highest rating points in Packaging, and Chirag gave the highest rating points in Hygiene.

5. Everyone rated Ravi between 5 and 7 in Behaviour. Unique maximum and minimum ratings in this parameter were given by Atal and Deepak respectively.

6. If the customers are ranked based on ratings given by them in individual parameters, then Atal's rank based on Packaging is the same as that based on Hygiene. This is also true for Deepak.

What was the minimum rating that Ravi received from any customer in any parameter? (in numerical value)

A) 6 B) C) D)

Explanation:- The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are $(6, 5)$ or $(9, 4)$

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene.

So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26

CAT_2021_Slot2					
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Minimum rating given is 5

Question No. : 34

The COMPLETE list of customers who gave the maximum total rating points to Ravi is

- A) Atal and Bihari B) Bihari C) Atal D) Bihari and Chirag

Explanation:- The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are $(6, 5)$ or $(9, 4)$

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene.

So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	5	25
Bihari	6	9	6	5	26
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26	21	

CAT_2021_Slot2					
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Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect. We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
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In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
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Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Bihari & Chirag gave maximum 27 points

Question No. : 35

What rating did Atal give on Timeliness? (in numerical value)

- A) 6 B) C) D)

Explanation:- The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

CAT_2021_Slot2					
	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
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Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
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Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
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Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Atal gave rating of 6 on timeliness

Question No. : 36

What BEST can be concluded about the tip amount given by Deepak?

- A) Either Rs. 0 or Rs. 30 or Rs. 50 B) Rs. 50 C) Either Rs. 30 or Rs. 50 D) Rs. 30

Explanation:- The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene.

So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
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Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
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Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
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Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Deepak can give a tip of Rs 30 or 50

Question No. : 37

In which parameter did Atal give the maximum rating points to Ravi?

- A) Hygiene B) Packaging C) Timeliness D) Behaviour

Explanation:- The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene.

So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
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Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	26

total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect. We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
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In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
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Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Atal gave maximum points in behaviour

Question No. : 38

What rating did Deepak give on Packaging?

- ✓A) 7 B) 5 C) 6 D) 8

Explanation:- The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
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Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
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Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Deepak gave rating of 7 on packaging

DIRECTIONS for the question: Study the following information carefully and answer the given question.

Question No. : 39

Ten objects o1, o2, ..., o10 were distributed among Amar, Barat, Charles, Disha, and Elise. Each item went to exactly one person. Each person got exactly two of the items, and this pair of objects is called her/his bundle.

The following table shows how each person values each object.

o1	o2	o3	o4	o5	o6	o7	o8	o9	o10
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CAT_2021_Slot2										
Amar	4	9	9	3	7	3	8	7	9	5
Barat	5	9	7	5	5	3	6	8	10	8
Charles	8	8	8	3	6	4	5	8	9	6
Disha	8	8	8	5	5	3	6	4	9	8
Elise	6	8	9	5	6	5	6	3	7	10

The value of any bundle by a person is the sum of that person's values of the objects in that bundle. A person X envies another person Y if X values Y's bundle more than X's own bundle.

For example, hypothetically suppose Amar's bundle consists of o1 and o2, and Barat's bundle consists of o3 and o4. Then Amar values his own bundle at $4 + 9 = 13$ and Barat's bundle at $9 + 3 = 12$. Hence Amar does not envy Barat. On the other hand, Barat values his own bundle at $7 + 5 = 12$ and Amar's bundle at $5 + 9 = 14$. Hence Barat envies Amar.

The following facts are known about the actual distribution of the objects among the five people.

1. If someone's value for an object is 10, then she/he received that object.
2. Objects o1, o2, and o3 were given to three different people.
3. Objects o1 and o8 were given to different people.
4. Three people value their own bundles at 16. No one values her/his own bundle at a number higher than 16.
5. Disha values her own bundle at an odd number. All others value their own bundles at an even number.
6. Some people who value their own bundles less than 16 envy some other people who value their own bundle at 16. No one else envies others.

What BEST can be said about object o8?

- A) o8 was given to Amar, Charles, or Disha B) o8 was given to Charles C) o8 was given to Disha
D) o8 was given to Charles or Disha

Explanation:- Since, Bharat value o9 = 10 and Elsie value o10 = 10, they definitely receive so Also, three people value their bundle = 16 and no value could be greater than 16 (Except Disha as she values her bundle as odd, number)

The other object of Bharat must be o7 = 6 to make it total = 16 (even)

And the other object of Elsie must be either o1 or o5

Now if Amar value his bundle = 16, objects received o2 or o3 = 9 and o5 or o8 = 7

Let say combination is o2 and o5, in that case Elsie must get o1

Then Charles get either o3 or o8 along with o6, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	x	x	x	o1 = 8	x
o2	o2/o3 = 9	x	o2/o3 = 8	x	x
o3		x		x	x
o4	x	x	x	o4 = 5	x
o5	x	x	x	x	o5 = 6
o6	o6 = 3	x	x	x	x
o7	x	o7 = 6	x	x	x
o8	x	x	o8 = 8	x	x
o9	x	o9 = 10	x	x	x
o10	x	x	x	x	o10 = 10
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

o8 was given to Charles

Question No. : 40

Who among the following envies someone else?

- A) Barat B) Elise C) Charles D) Amar

Explanation:- Since, Bharat value $o_9 = 10$ and Elsie value $o_{10} = 10$, they definitely receive so

Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o_7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either o_1 or o_5

Now if Amar value his bundle = 16, objects received o_2 or $o_3 = 9$ and o_5 or $o_8 = 7$

Let say combination is o_2 and o_5 , in that case Elsie must get o_1

Then Charles get either o_3 or o_8 along with o_6 , total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	x	x	x	$o_1 = 8$	x
o2	$o_2/o_3 = 9$	x	$o_2/o_3 = 8$	x	x
o3		x		x	
o4	x	x	x	$o_4 = 5$	x
o5	x	x	x	x	$o_5 = 6$
o6	$o_6 = 3$	x	x	x	x
o7	x	$o_7 = 6$	x	x	x
o8	x	x	$o_8 = 8$	x	x
o9	x	$o_9 = 10$	x	x	x
o10	x	x	x	x	$o_{10} = 10$
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

Amar with 12 bundle value envies others with bundle value 16

Question No. : 41

What is Amar's value for his own bundle? (in numerical value)

- A) 12 B) C) D)

Explanation:- Since, Bharat value $o_9 = 10$ and Elsie value $o_{10} = 10$, they definitely receive so

Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o_7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either o_1 or o_5

Now if Amar value his bundle = 16, objects received o_2 or $o_3 = 9$ and o_5 or $o_8 = 7$

Let say combination is o_2 and o_5 , in that case Elsie must get o_1

Then Charles get either o_3 or o_8 along with o_6 , total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o_1	x	x	x	$o_1 = 8$	x
o_2	$o_2/o_3 = 9$	x	$o_2/o_3 = 8$	x	x
o_3		x		x	
o_4	x	x	x	$o_4 = 5$	x
o_5	x	x	x	x	$o_5 = 6$
o_6	$o_6 = 3$	x	x	x	x
o_7	x	$o_7 = 6$	x	x	x
o_8	x	x	$o_8 = 8$	x	x
o_9	x	$o_9 = 10$	x	x	x
o_{10}	x	x	x	x	$o_{10} = 10$
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

Amar's bundle value = 12

Question No. : 42

Object o4 was given to

- A) Elise B) Charles C) Barat ✓D) Disha

Explanation:- Since, Bharat value $o9 = 10$ and Elsie value $o10 = 10$, they definitely receive so

Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either $o1$ or $o5$

Now if Amar value his bundle = 16, objects received $o2$ or $o3 = 9$ and $o5$ or $o8 = 7$

Let say combination is $o2$ and $o5$, in that case Elsie must get $o1$

Then Charles get either $o3$ or $o8$ along with $o6$, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	x	x	x	$o1 = 8$	x
o2	$o2/o3 = 9$	x	$o2/o3 = 8$	x	x
o3		x		x	x
o4	x	x	x	$o4 = 5$	x
o5	x	x	x	x	$o5 = 6$
o6	$o6 = 3$	x	x	x	x
o7	x	$o7 = 6$	x	x	x
o8	x	x	$o8 = 8$	x	x
o9	x	$o9 = 10$	x	x	x
o10	x	x	x	x	$o10 = 10$
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

o4 was given to Disha

Question No. : 43

Object o5 was given to

- A) Disha ✓B) Elise C) Charles D) Amar

Explanation:- Since, Bharat value $o9 = 10$ and Elsie value $o10 = 10$, they definitely receive so

Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either $o1$ or $o5$

Now if Amar value his bundle = 16, objects received $o2$ or $o3 = 9$ and $o5$ or $o8 = 7$

Let say combination is $o2$ and $o5$, in that case Elsie must get $o1$

Then Charles get either $o3$ or $o8$ along with $o6$, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	x	x	x	$o1 = 8$	x
o2	$o2/o3 = 9$	x	$o2/o3 = 8$	x	x
o3		x		x	
o4	x	x	x	$o4 = 5$	x
o5	x	x	x	x	$o5 = 6$
o6	$o6 = 3$	x	x	x	x
o7	x	$o7 = 6$	x	x	x
o8	x	x	$o8 = 8$	x	x
o9	x	$o9 = 10$	x	x	x
o10	x	x	x	x	$o10 = 10$
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

$o5$ was given to Elise

Question No. : 44

What BEST can be said about the distribution of object o1?

- A) o1 was given to Charles B) o1 was given to Charles or Disha ✓C) o1 was given to Disha
 D) o1 was given to Charles, Disha, or Elise

Explanation:- Since, Bharat value $o9 = 10$ and Elsie value $o10 = 10$, they definitely receive so
 Also, three people value their bundle = 16 and no value could be greater than 16
 (Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either o1 or o5

Now if Amar value his bundle = 16, objects received o2 or o3 = 9 and o5 or o8 = 7

Let say combination is o2 and o5, in that case Elsie must get o1

Then Charles get either o3 or o8 along with o6, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	x	x	x	$o1 = 8$	x
o2	$o2/o3 = 9$	x	$o2/o3 = 8$	x	x
o3		x		x	x
o4	x	x	x	$o4 = 5$	x
o5	x	x	x	x	$o5 = 6$
o6	$o6 = 3$	x	x	x	x
o7	x	$o7 = 6$	x	x	x
o8	x	x	$o8 = 8$	x	x
o9	x	$o9 = 10$	x	x	x
o10	x	x	x	x	$o10 = 10$
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

o1 was given to Disha

Section : Quantitative Ability

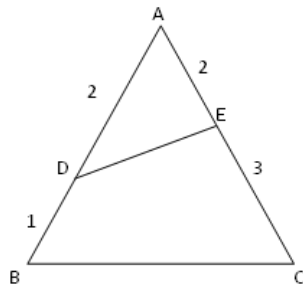
DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 45

Let D and E be points on sides AB and AC, respectively, of a triangle ABC, such that $AD : BD = 2 : 1$ and $AE : CE = 2 : 3$. If the area of the triangle ADE is 8 sq cm, then the area of the triangle ABC, in sq cm, is (in numerical value)

- A) 30 B) C) D)

Explanation:- Let $AD = 2x, BD = x$
 $AE = 2y, EC = 3y$
 Area of $\triangle AED = 8$



$$\Rightarrow \frac{1}{2} \times 2x \times 2y \times \sin A = 8$$

$$\Rightarrow 2xy \sin A = 8$$

$$\Rightarrow xy \sin A = 4 \quad \text{----(i)}$$

$$\begin{aligned} \text{Area of } \triangle ABC &= \frac{1}{2} \times 3x \times 5y \sin A \\ &= \frac{1}{2} \times 15 \times xy \sin A \\ &= \frac{1}{2} \times 15 \times 4 = 30 \text{ Sq unit} \end{aligned}$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 46

Two trains A and B were moving in opposite DIRECTIONSs, their speeds being in the ratio 5 : 3. The front end of A crossed the rear end of B 46 seconds after the front ends of the trains had crossed each other. It took another 69 seconds for the rear ends of the trains to cross each other. The ratio of length of train A to that of train B is

- ✓ A) 3 : 2 B) 2 : 1 C) 5 : 3 D) 2 : 3

Explanation:- Let the speeds of trains A and B be $5x$ & $3x$ respectively and their lengths be l_1 & l_2 respectively.
 In the first case, distance travelled will be equal to length of train B

$$\therefore \frac{l_2}{8x} = 46 \Rightarrow l_2 = 46 \times 8x$$

In the second case, distance travelled will be equal to length of train A.

$$\therefore \frac{l_1}{8x} = 69 \Rightarrow l_1 = 8x \times 69$$

$$\therefore \text{Required ratio} = \frac{l_1}{l_2} = \frac{8x \times 69}{46 \times 8x} = \frac{3}{2}$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 47

Anil, Bobby and Chintu jointly invest in a business and agree to share the overall profit in proportion to their investments. Anil's share of investment is 70%. His share of profit decreases by Rs. 420 if the overall profit goes down from 18% to 15%. Chintu's share of profit increases by Rs. 80 if the overall profit goes up from 15% to 17%. The amount, in INR, invested by Bobby is

- A) 2200 B) 2400 ✓C) 2000 D) 1800

Explanation:- Here the investment of Anil is 70% of the total investment. Now his share of profit decreased by Rs 420 when the profit decreased from 18% to 15%. So 70% of (decreased profit) = 420

⇒ Decreased profit = $420/0.7 = \text{Rs } 600$.

Therefore, 3% of total investment = 600 ⇒ Total investment = Rs 20000

So, Anil's investment is 70% of 20000 = Rs 14000.

Now Chintu's profit increased by Rs 80 when the profit increases from 15% to 17%.

Therefore, 2% of Chintu's investment = 80 ⇒ Chintu's investment = $80/0.02 = \text{Rs } 4000$

Hence, Bobby's investment = $20000 - (14000 + 4000) = \text{Rs } 2000$.

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 48

The sides AB and CD of a trapezium ABCD are parallel, with AB being the smaller side. P is the midpoint of CD and ABPD is a parallelogram. If the difference between the areas of the parallelogram ABPD and the triangle BPC is 10 sq cm, then the area, in sq cm, of the trapezium ABCD is

- A) 40 B) 25 C) 20 ✓D) 30

Explanation:- Join AP

Here in $\triangle ADP$ & $\triangle BPC$,

$AD = BP, DP = PC$

$\angle BPC = \angle PBA = \angle ADP$

⇒ $\triangle ADP$ & $\triangle BPC$ are congruent

Also AP is diagonal of parallelogram ABPD

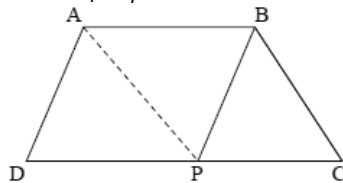
∴ $\text{Ar}(\triangle ADP) = \text{Ar}(\triangle ABP)$

Let $\text{Ar}(\triangle ADP) = x = \text{Ar}(\triangle ABP) = \text{Ar}(\triangle BPC)$

∴ Area of trapezium ABCD = $3x$

Now given that $2x - x = 10 \Rightarrow x = 10$

∴ Area of trapezium = $10 \times 3 = 30\text{cm}^2$



DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 49

A person buys tea of three different qualities at Rs. 800, Rs. 500, and Rs. 300 per kg, respectively, and the amounts bought are in the proportion 2 : 3 : 5. She mixes all the tea and sells one-sixth of the mixture at Rs. 700 per kg. The price, in INR per kg, at which she should sell the remaining tea, to make an overall profit of 50%, is

- ✓A) 688 B) 675 C) 653 D) 692

Explanation:- Let the quantities bought are 6kg, 9kg & 15kg respectively.

$$\text{Total cost} = 6 \times 800 + 500 \times 9 + 300 \times 15 = \text{Rs } 13800$$

$$\text{Total SP} = 13800 \times 1.5 = \text{Rs } 20700$$

$$\text{SP of 5kg} = 5 \times 700 = \text{Rs } 3500$$

$$\text{Remaining SP} = \text{Rs } 17200$$

$$\therefore \text{SP/kg} = \frac{17200}{25} = \text{Rs. } 688$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 50

If a rhombus has area 12 sq cm and side length 5 cm, then the length, in cm, of its longer diagonal is

- A) $\sqrt{13} + \sqrt{12}$ ✓B) $\sqrt{37} + \sqrt{13}$ C) $\frac{\sqrt{13} + \sqrt{12}}{2}$ D) $\frac{\sqrt{37} + \sqrt{13}}{2}$

Explanation:- Area of rhombus = 12

$$\Rightarrow \frac{1}{2} d_1 \times d_2 = 12$$

$$d_1 \times d_2 = 24$$

$$\text{Also } \frac{d_1^2}{4} + \frac{d_2^2}{4} = 25 \Rightarrow d_1^2 + d_2^2 = 100$$

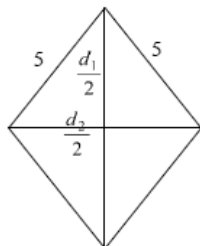
$$\text{Now } (d_1 + d_2)^2 = d_1^2 + d_2^2 + 2d_1d_2 = 100 + 48 = 148$$

$$\Rightarrow d_1 + d_2 = 2\sqrt{37} \quad \text{---(1)}$$

$$\text{Again } (d_1 - d_2)^2 = d_1^2 + d_2^2 - 2d_1d_2 = 100 - 48 = 52$$

$$\Rightarrow d_1 - d_2 = 2\sqrt{13} \quad \text{---(2)}$$

$$(1) + (2) \Rightarrow 2d_1 = 2(\sqrt{37} + \sqrt{13}) \Rightarrow d_1 = \sqrt{37} + \sqrt{13}$$



DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 51

Three positive integers x , y and z are in arithmetic progression. If $y - x > 2$ and $xyz = 5(x + y + z)$, then $z - x$ equals

- ✓ A) 14 B) 10 C) 8 D) 12

Explanation:- Here x, y, z are in AP

$$\Rightarrow y = \frac{x+z}{2} \Rightarrow x+z = 2y$$

$$\text{Now } xyz = 5(x + y + z)$$

$$\Rightarrow xyz = 5 \times (2y + y)$$

$$\Rightarrow xyz = 5 \times 3y$$

$$\Rightarrow xz = 15$$

Now (x, z) can be $(3, 5)$ & $(1, 15)$

But if x & z are 3 & 5 then $y - x$ is no greater than 2 $\Rightarrow x = 1, z = 15$ and $y = 8$

$$\Rightarrow z - x = 14.$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 52

For a 4-digit number, the sum of its digits in the thousands, hundreds and tens places is 14, the sum of its digits in the hundreds, tens and units places is 15, and the tens place digit is 4 more than the units place digit. Then the highest possible 4-digit number satisfying the above conditions is (in numerical value)

- A) 4195 B) C) D)

Explanation:- Let the number is $abcd$

$$\text{Given the } a + b + c = 14 \quad \text{-----(1)}$$

$$b + c + d = 15 \quad \text{-----(2)}$$

$$\& c = d + 4 \quad \text{-----(3)}$$

$$(2) - (1) \Rightarrow d - a = 1 \Rightarrow a = d - 1 \quad \text{-----(4)}$$

As highest number is asked $\Rightarrow a$ should be max. So (4) $\Rightarrow d$ should be maximum, or (3) $\Rightarrow c$ should be maximum $\Rightarrow c = 9 \Rightarrow d = 5$

$$\therefore (4) \Rightarrow a = 4 \& (1) \Rightarrow 4 + b + 9 = 14 \Rightarrow b = 1$$

\therefore Number is 4195.

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 53

The number of ways of distributing 15 identical balloons, 6 identical pencils and 3 identical erasers among 3 children, such that each child gets at least four balloons and one pencil, is (in numerical value)

- A) 1000 B) C) D)

Explanation:- We have 15 identical balloons, 6 identical pencils and 3 identical erasers. Let the children are A, B and C. Now every child should get four balloons and one pencil. So first distribute 4 balloons and one pencil to A, B and C. We are left with 3 balloons, 3 pencils and 3 erasers.

3 balloons can be distributed to A, B, C in $3 + 3 - 1C3 - 1$ Or $5C2 = 10$ ways.

Similarly, 3 pencils can & 3 erasers can be distributed in 10 ways each.

$$\therefore \text{Total ways} = 10 \times 10 \times 10 = 1000$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 54

For all possible integers n satisfying $2.25 \leq 2 + 2^{n+2} \leq 202$, the number of integer values of $3 + 3^{n+1}$ is (in numerical value)

A) 7 B) C) D)

Explanation:- Given that $2.25 \leq 2 + 2^{n+2} \leq 202$

$$\Rightarrow 2 + 0.25 \leq 2 + 2^{n+2} \leq 2 + 128 < 202$$

$$\Rightarrow 2 + 2^{-2} \leq 2 + 2^{n+2} \leq 2 + 2^7$$

$$\therefore -2 \leq n + 2 \leq 7 \Rightarrow -4 \leq n \leq 5$$

$$\therefore n = -4, -3, -2, -1, 0, 1, 2, 3, 4, 5$$

Now for $n = -1, 0, 1, 2, 3, 4, 5$, $3 + 3^{n+1}$ is an integer.

Therefore total '7' values of 'n' are possible.

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 55

Raj invested Rs. 10000 in a fund. At the end of first year, he incurred a loss but his balance was more than Rs. 5000. This balance, when invested for another year, grew and the percentage of growth in the second year was five times the percentage of loss in the first year. If the gain of Raj from the initial investment over the two year period is 35%, then the percentage of loss in the first year is

✓A) 10 B) 15 C) 70 D) 5

Explanation:- Let the loss incurred in first year is $x\%$

As the balance is more than 5000 $\Rightarrow x < 50\%$

Profit in the next year = $5x$ & overall profit is 35%

$$\Rightarrow 5x - x + \frac{5x(-x)}{100} = 35$$

$$\Rightarrow 4x - \frac{x^2}{20} = 35$$

$$\Rightarrow x^2 - 80x + 700 = 0$$

$$\Rightarrow (x - 70)(x - 10) = 0$$

$$\Rightarrow x = 10, 70$$

As $x < 50\% \Rightarrow x = 10\%$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 56

Two pipes A and B are attached to an empty water tank. Pipe A fills the tank while pipe B drains it. If pipe A is opened at 2 pm and pipe B is opened at 3 pm, then the tank becomes full at 10 pm. Instead, if pipe A is opened at 2 pm and pipe B is opened at 4 pm, then the tank becomes full at 6 pm. If pipe B is not opened at all, then the time, in minutes, taken to fill the tank is

A) 264 ✓B) 144 C) 140 D) 120

Explanation:- In the first case A worked for 8 hours and B worked for 7 hours.

In the second case A worked for 4 hours and B worked for 2 hours.

\therefore If B worked 5 hours less then time saved for A = 4 hour

B does not work then time saved for A = $4/5 \times 7 = 5.6$ hours

So in this A would have filled the tank in $8 - 5.6 = 2.4$ hour or 144 minutes.

DIRECTION for the question: Solve the following question and mark the best possible option.

Question No. : 57

A box has 450 balls, each either white or black, there being as many metallic white balls as metallic black balls. If 40% of the white balls and 50% of the black balls are metallic, then the number of non-metallic balls in the box is (in numerical value)

- A) 250 B) C) D)

Explanation:- Let the metallic white and metallic black balls are x each.

Now 40% of white balls = $x \Rightarrow$ white balls = $2.5x$

& 50% of black balls = $x \Rightarrow$ Total black balls = $2x$

Now $2.5x + 2x = 450 \Rightarrow 4.5x = 450 \Rightarrow x = 100$

\therefore Number of non-metallic white & non metallic black balls = $1.5x + x = 2.5x = 2.5 \times 100 = 250$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 58

For all real values of x , the range of the function $f(x) = \frac{x^2 + 2x + 4}{2x^2 + 4x + 9}$ is

- A) $\left(\frac{3}{7}, \frac{1}{2}\right)$ B) $\left[\frac{3}{7}, \frac{1}{2}\right)$ C) $\left[\frac{3}{7}, \frac{8}{9}\right)$ D) $\left[\frac{4}{9}, \frac{8}{9}\right)$

Explanation:- Let $\frac{x^2 + 2x + 4}{2x^2 + 4x + 9} = k$

$\Rightarrow x^2 + 2x + 4 = 2kx^2 + 4kx + 9k$

$\Rightarrow (2k - 1)x^2 + (4k - 2)x + (9k - 4) = 0$

As x is real $\Rightarrow D \geq 0$

$\Rightarrow (4k - 2)^2 - 4(2k - 1)(9k - 4) \geq 0$

$\Rightarrow (2k - 1)^2 - (2k - 1)(9k - 4) \geq 0$

$\Rightarrow (2k - 1)[2k - 1 - 9k + 4] \geq 0$

$\Rightarrow (2k - 1)(-7k + 3) \geq 0$

$\Rightarrow (2k - 1)(7k - 3) \leq 0$

$\Rightarrow \frac{3}{7} \leq k \leq \frac{1}{2}$

\therefore option 2 is the best choice

DIRECTIONS for the question : Solve the following question and mark the best possible option.

Question No. : 59

If $\log_2 [3 + \log_3 \{4 + \log_4 (x - 1)\}] - 2 = 0$, then $4x$ equals (in numerical value)

- A) 5 B) C) D)

Explanation:- Here $\log_2 [3 + \log_3 \{4 + \log_4 (x-1)\}] - 2 = 0$

$\Rightarrow \log_2 [3 + \log_3 \{4 + \log_4 (x-1)\}] = 2$

$\Rightarrow 3 + \log_3 \{4 + \log_4 (x-1)\} = 4$

$\Rightarrow \log_3 [4 + \log_4 (x-1)] = 1$

$\Rightarrow 4 + \log_4 (x-1) = 3$

$\Rightarrow \log_4 (x-1) = -1 \Rightarrow x - 1 = \frac{1}{4} \Rightarrow x = 5/4$

Now $4x = 4 \times \frac{5}{4} = 5$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 60

Consider the pair of equations: $x^2 - xy - x = 22$ and $y^2 - xy + y = 34$. If $x > y$, then $x - y$ equals

- ✓A) 8 B) 6 C) 4 D) 7

Explanation:- We have $x^2 - xy - x = 22$ ---(1)

$$y^2 - xy + y = 34 \quad \text{---(2)}$$

Add the equation (1) & (2), we get

$$x^2 + y^2 - 2xy - (x - y) = 56$$

$$\Rightarrow (x - y)^2 - (x - y) = 56$$

$$\Rightarrow (x - y)(x - y - 1) = 56$$

As $(x - y)$ and $(x - y - 1)$ are consecutive numbers and their product is $56 \Rightarrow x - y = 8$ & $x - y - 1 = 7$.

$$\therefore x - y = 8$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 61

For a sequence of real numbers x_1, x_2, \dots, x_n , if $x_1 - x_2 + x_3 - \dots + (-1)^{n+1} x_n = n^2 + 2n$ for all natural numbers n , then the sum $x_{49} + x_{50}$ equals

- A) 200 ✓B) -2 C) 2 D) -200

Explanation:- Here $x_1 - x_2 + x_3 - x_4 + \dots + (-1)^{n+1} x_n = n^2 + 2n$

$$n = 1 \Rightarrow x_1 = 1 + 2 = 3$$

$$n = 2 \Rightarrow x_1 - x_2 = 8 \Rightarrow x_2 = -5$$

$$n = 3 \Rightarrow x_1 - x_2 + x_3 = 15 \Rightarrow x_3 = 7$$

$$n = 4 \Rightarrow x_1 - x_2 + x_3 - x_4 = 24 \Rightarrow x_4 = -9 \text{ and so on}$$

Now here $x_1 + x_2 = -2$, $x_3 + x_4 = -2$ and so on, so $x_{49} + x_{50} = -2$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 62

From a container filled with milk, 9 litres of milk are drawn and replaced with water. Next, from the same container, 9 litres are drawn and again replaced with water. If the volumes of milk and water in the container are now in the ratio of 16 : 9, then the capacity of the container, in litres, is (in numerical value)

- A) 45 B) C) D)

$$\text{Here } \frac{\text{milk}}{\text{Total vol}} = \frac{16}{25} = \left(\frac{4}{5}\right)^2$$

$$\therefore \frac{1}{5} \text{ of total mixture is taken out every time}$$

$$\text{Explanation:- } \therefore \frac{1}{5} \times T = 9 \Rightarrow T = 45$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 63

For a real number x the condition $|3x - 20| + |3x - 40| = 20$ necessarily holds if

- ✓ A) $7 < x < 12$ B) $9 < x < 14$ C) $10 < x < 15$ D) $6 < x < 11$

Explanation:- Here $|3x - 20| + |3x - 40| = 20$ ---(1)

Case I: If $x < \frac{20}{3}$, (1) $\Rightarrow -(3x - 20) - (3x - 40) = 20$

$$\Rightarrow -3x + 20 - 3x + 40 = 20$$

$$\Rightarrow -6x = -40 \Rightarrow x = \frac{20}{3}, \text{ but } x < \frac{20}{3}$$

\therefore This is not possible

Case II: If $\frac{20}{3} \leq x < \frac{40}{3}$, (1) $\Rightarrow 3x - 20 - 3x + 40 = 20 \Rightarrow 20 = 20$ which is true

$$\therefore \frac{20}{3} \leq x < \frac{40}{3}$$

Case III: If $x \geq \frac{40}{3}$, $\Rightarrow 3x - 20 + 3x - 40 = 20 \Rightarrow 6x = 80 \Rightarrow x = \frac{40}{3}$

Combining the case II & III, we have $\frac{20}{3} \leq x \leq \frac{40}{3}$ or $6.67 \leq x \leq 13.33$

Therefore, option (1) satisfies.

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 64

In a football tournament, a player has played a certain number of matches and 10 more matches are to be played. If he scores a total of one goal over the next 10 matches, his overall average will be 0.15 goals per match. On the other hand, if he scores a total of two goals over the next 10 matches, his overall average will be 0.2 goals per match. The number of matches he has played is (in numerical value)

- A) 10 B) C) D)

Explanation:- Let the original matches be 'n' and original goals be 'x'

$$\text{Now } (n + 10) \times 0.15 = x + 1$$

$$\Rightarrow 0.15n + 1.5 = x + 1 \quad \text{---(1)}$$

$$\& (n + 10) \times 0.2 = x + 2$$

$$\Rightarrow 0.2n + 2 = x + 2 \quad \text{---(2)}$$

$$(2) - (1) \Rightarrow 0.05n + 0.5 = 1 \Rightarrow 0.05n = 0.5 \Rightarrow n = \frac{0.5}{0.05} = 10$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 65

Suppose one of the roots of the equation $ax^2 - bx + c = 0$ is $2 + \sqrt{13}$, where a , b and c are rational numbers and $a \neq 0$. If $b = c^3$ then $|a|$ equals

- A) 4 ✓B) 2 C) 1 D) 3

Explanation:- Given equation is $ax^2 - bx + c = 0$

Its one root is $2 + \sqrt{3}$, so second root will $2 - \sqrt{3}$,

$$\text{Sum of roots} = \frac{b}{a} = 2 + \sqrt{3} + 2 - \sqrt{3} = 4$$

$$\therefore \frac{b}{a} = 4 \quad \text{---(1)}$$

$$\text{Product of roots} = \frac{c}{a} = (2 + \sqrt{3})(2 - \sqrt{3}) = 1$$

$$\Rightarrow \frac{c}{a} = 1 \quad \text{---(2)}$$

$$(1) / (2) \Rightarrow \frac{b}{c} = 4 \Rightarrow b = 4c \quad \text{---(3)}$$

$$\text{Also } b = c^3, (3) \Rightarrow c^3 = 4c \Rightarrow c^2 = 4 \Rightarrow c = 2, -2$$

$$\text{If } c = 2 \Rightarrow b = 8$$

$$\text{Now } \frac{b}{a} = 4 \Rightarrow \frac{8}{a} = 4 \Rightarrow a = 2 \Rightarrow |a| = 2$$

$$\text{If } c = -2, b = -8 \text{ \& } \frac{b}{a} = 4 \Rightarrow \frac{-8}{a} = 4 \Rightarrow a = -2 = |a| = 2$$

DIRECTIONS for the question: Solve the following question and mark the best possible option.

Question No. : 66

Anil can paint a house in 60 days while Bimal can paint it in 84 days. Anil starts painting and after 10 days, Bimal and Charu join him. Together, they complete the painting in 14 more days. If they are paid a total of Rs. 21000 for the job, then the share of Charu, in INR, proportionate to the work done by him, is

- ✓A) 9100 B) 9150 C) 9000 D) 9200

Explanation:- Let the total work is 420 units

A can do 7 units/d, B can do 5 units / day

Let C can do x units/d

$$\therefore 7 \times 24 + 5 \times 14 + x \times 14 = 420 \Rightarrow 14x + 238 = 420 \Rightarrow 14x = 182 \Rightarrow x = 13$$

Work done by A = 168 units

Work done by B = 70 units

Work done by C = 182 units

\therefore Ratio of work done by A, B & C is 168 : 70 : 182 or 84 : 35 : 91

$$\therefore \text{Amount given to C} = \frac{91}{210} \times 21000 = \text{Rs } 9100$$