CAT 2023 Slot 2 DILR Solutions

Ques 1. Odsville has five firms - Alfloo, Bzygoo, Czechy, Drjbna and Elavalaki. Each of these firms was founded in some year and also closed down a few years later.
Each firm raised Rs. 1 crore in its first and last year of existence. The amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down. No firm raised the same amount of money in two consecutive years. Each annual increase and decrease was either by Rs. 1 crore or by Rs. 2 crores. The table below provides partial information about the five firms.

Firm	First year of existence	Last year of existence	Total amount raised (Rs. Crores)
Alfloo	2009	2016	21
Bzygoo	2012	2015	
Czechy	2013		9
Drjbna	2011	2015	10
Elavalaki	2010		13

For which firm(s) can the amounts raised by them be concluded with certainty in each year?
A Only Bzygoo and Czechy and Drjbna
B Only Czechy and Drjbna
C Only Drjbna
D Only Czechy

Solu. B
In this set, we are told that the amount each firm raised every year increased

until it reached a maximum, and then decreased until the firm closed down and
no firm raised the same amount of money in two consecutive years.
The increase or decrease can be ± 1 or ± 2. => (1)
We are also told that each firm raised Rs. 1 crore in its first and last year of existence
Consider A:
It raised money for 8 years
=> The raising pattern looks like follows:
1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.
Also a + b + c + d + e + f = 21 - 2 = 19
We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.
If a = 3 and f=3=> b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.
If a = 3 and f=2=> b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.
=> a = 2 and f=2=> b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.
So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:
The patterns looks as follows:
1, a, b, 1
If a = 2, b has to be equal to 3 to satisfy (1)
if a = 3 , b has to be equal to 2 to satisfy (1)
=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:
The pattern looks as follows:

1,..., 1
Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1
Let us assume there are 3 gaps between => a + b + c = 7 the minimum case possible is 1, 2, 3, 2 ,1=> Satisfies.
Now, if there are 4 gaps => a+b+c+d=7=> The average value is 7/4 which is less than 2 => Not possible.
=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:
The pattern looks as follows:
1, a, b, c, 1
=> a + b + c = 8
When a = 2 and c=2 => b = 4 =>2 4, 2 => Satisfies.
When a = 2 and c = 3 b should be 3 (Not satisfying (1))
When a = 3 and c = 3 b should be 2 (Not satisfying (1))
=> The possible cases for D are:
Consider E:
The pattern looks as follows:
1,....,1
For 1 or 2 gaps, we can't get a sum of 11.
Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.
Now, assume 4 gaps
=> a+b+c+d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2+3+4+2=11.
=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

We see that only for C and D, we can conclude the amounts raised with certainty.

Ques 2. What best can be concluded about the total amount of money raised in 2015?
A It is either Rs. 7 crores or Rs. 8 crores or Rs. 9 crores.
BIt is exactly Rs. 8 crores.
C It is either Rs. 7 crores or Rs. 8 crores.
D It is either Rs. 8 crores or Rs. 9 crores.

Solu. C
In this set, we are told that the amount each firm raised every year increased
until it reached a maximum, and then decreased until the firm closed down and
no firm raised the same amount of money in two consecutive years.
The increase or decrease can be ± 1 or ± 2. => (1)
We are also told that each firm raised Rs. 1 crore in its first and last year of existence
Consider A:

It raised money for 8 years
=> The raising pattern looks like follows:
1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.
Also a + b + c + d + e + f = 21 - 2 = 19
We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.
If a = 3 and f=3=> b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.
If a = 3 and f=2=> b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.
=> a = 2 and f=2=> b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.
So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:
The patterns looks as follows:
1, a, b, 1
If a = 2, b has to be equal to 3 to satisfy (1)
if a = 3 , b has to be equal to 2 to satisfy (1)
=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:
The pattern looks as follows:
1,..., 1
Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1
Let us assume there are 3 gaps between => a + b + c = 7 the minimum case possible is 1, 2, 3, 2 ,1=> Satisfies.
Now, if there are 4 gaps => a+b+c+d=7=> The average value is 7/4 which is less than 2 => Not possible.

=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:
The pattern looks as follows:
1, a, b, c, 1
=> a + b + c = 8
When a = 2 and c=2 => b = 4 =>2 4, 2 => Satisfies.
When a = 2 and c = 3 b should be 3 (Not satisfying (1))
When a = 3 and c = 3 b should be 2 (Not satisfying (1))
=> The possible cases for D are:
Consider E:
The pattern looks as follows:
1,....,1
For 1 or 2 gaps, we can't get a sum of 11.
Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 =>
Satisfies.
Now, assume 4 gaps
=> a+b+c+d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies
(1) and 2+3+4+2=11.
=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Money raised in 2015 is 2 + 1 + 3 + 1 + 0/1 = 7 or 8

Ques 3. What is the largest possible total amount of money (in Rs. crores) that could have been raised in 2013?

Solu. 17

In this set, we are told that the amount each firm raised every year increased
until it reached a maximum, and then decreased until the firm closed down and
no firm raised the same amount of money in two consecutive years.
The increase or decrease can be ± 1 or ± 2. => (1)
We are also told that each firm raised Rs. 1 crore in its first and last year of existence
Consider A:
It raised money for 8 years
=> The raising pattern looks like follows:
1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.
Also a + b + c + d + e + f = 21 - 2 = 19

We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.
If a = 3 and f=3=> b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.
If a = 3 and f=2=> b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.
=> a = 2 and f=2=> b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.
So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:
The patterns looks as follows:
1, a, b, 1
If a = 2, b has to be equal to 3 to satisfy (1)
if a = 3 , b has to be equal to 2 to satisfy (1)
=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:
The pattern looks as follows:
1,..., 1
Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1
Let us assume there are 3 gaps between => a + b + c = 7 the minimum case possible is 1, 2, 3, 2 ,1=> Satisfies.
Now, if there are 4 gaps => a+b+c+d=7=> The average value is 7/4 which is less than 2 => Not possible.
=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:
The pattern looks as follows:
1, a, b, c, 1
=> a + b + c = 8
When a = 2 and c=2 => b = 4 =>2 4, 2 => Satisfies.
When a = 2 and c = 3 b should be 3 (Not satisfying (1))
When a = 3 and c = 3 b should be 2 (Not satisfying (1))
=> The possible cases for D are:
Consider E:
The pattern looks as follows:
1,....,1
For 1 or 2 gaps, we can't get a sum of 11.
Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.
Now, assume 4 gaps
=> a+b+c+d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2+3+4+2=11.
=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Maximum money raised in 2013 is 5 + 3 + 1 + 4 + 4 = 17.

Ques 4. If Elavalaki raised Rs. 3 crores in 2013, then what is the smallest possible total amount of money (in Rs. crores) that could have been raised by all the companies in 2012?

A 12

B 9

C 11

D 10

Solu. C

In this set, we are told that the amount each firm raised every year increased
until it reached a maximum, and then decreased until the firm closed down and
no firm raised the same amount of money in two consecutive years.
The increase or decrease can be ± 1 or ± 2. => (1)
We are also told that each firm raised Rs. 1 crore in its first and last year of existence
Consider A:
It raised money for 8 years
=> The raising pattern looks like follows:
1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.
Also a + b + c + d + e + f = 21 - 2 = 19
We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.
If a = 3 and f=3=> b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.
If a = 3 and f=2=> b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.
=> a = 2 and f=2=> b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.
So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:

The patterns looks as follows:
1, a, b, 1
If a = 2, b has to be equal to 3 to satisfy (1)
if a = 3 , b has to be equal to 2 to satisfy (1)
=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:
The pattern looks as follows:
1,..., 1
Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1
Let us assume there are 3 gaps between => a + b + c = 7 the minimum case possible is 1, 2, 3, 2 ,1=> Satisfies.
Now, if there are 4 gaps => a+b+c+d=7=> The average value is 7/4 which is less than 2 => Not possible.
=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:
The pattern looks as follows:
1, a, b, c, 1
=> a + b + c = 8
When a = 2 and c=2 => b = 4 =>2 4, 2 => Satisfies.
When a = 2 and c = 3 b should be 3 (Not satisfying (1))
When a = 3 and c = 3 b should be 2 (Not satisfying (1))
=> The possible cases for D are:
Consider E:
The pattern looks as follows:
1,....,1
For 1 or 2 gaps, we can't get a sum of 11.

Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.
Now, assume 4 gaps
=> a+b+c+d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2+3+4+2=11.
=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Given that E raised 3 in 2013 => in 2012 he could have raised a minimum of 4 crores. => Minimum amount is 4 + 1 + 0 + 2 + 4 = 11 .

Ques 5. If the total amount of money raised in 2014 is Rs. 12 crores, then which of the following is not possible?
A Bzygoo raised the same amount of money as Elavalaki in 2013.
B Alfloo raised the same amount of money as Drjbna in 2013.
C Alfloo raised the same amount of money as Bzygoo in 2014.
D Bzygoo raised more money than Elavalaki in 2014.

Solu. A
In this set, we are told that the amount each firm raised every year increased

until it reached a maximum, and then decreased until the firm closed down and
no firm raised the same amount of money in two consecutive years.
The increase or decrease can be ± 1 or ± 2. => (1)
We are also told that each firm raised Rs. 1 crore in its first and last year of existence
Consider A:
It raised money for 8 years
=> The raising pattern looks like follows:
1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.
Also a + b + c + d + e + f = 21 - 2 = 19
We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.
If a = 3 and f=3=> b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.
If a = 3 and f=2=> b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.
=> a = 2 and f=2=> b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.
So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:
The patterns looks as follows:
1, a, b, 1
If a = 2, b has to be equal to 3 to satisfy (1)
if a = 3 , b has to be equal to 2 to satisfy (1)
=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:
The pattern looks as follows:

1,..., 1
Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1
Let us assume there are 3 gaps between => a + b + c = 7 the minimum case possible is 1, 2, 3, 2 ,1=> Satisfies.
Now, if there are 4 gaps => a+b+c+d=7=> The average value is 7/4 which is less than 2 => Not possible.
=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:
The pattern looks as follows:
1, a, b, c, 1
=> a + b + c = 8
When a = 2 and c=2 => b = 4 =>2 4, 2 => Satisfies.
When a = 2 and c = 3 b should be 3 (Not satisfying (1))
When a = 3 and c = 3 b should be 2 (Not satisfying (1))
=> The possible cases for D are:
Consider E:
The pattern looks as follows:
1,....,1
For 1 or 2 gaps, we can't get a sum of 11.
Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.
Now, assume 4 gaps
=> a+b+c+d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2+3+4+2=11.
=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Given that total amount raised in 2014 is 12 => 3+3/2+2+2+1/2=12 => possible case is 3+3+2+2+2=12. =>
A) In 2013, B raised 2 crores and E also raised 3/4 crores => Not Possible.
B) In 2013, A could have raised 5/4 and D raised 4 => Possible.
C) In 2014, A raised 3 and B raised 3 => Possible.
D) In 2014, B raised 3 where as E raised 2 => 3 > 2 => Possible.

Ques 6. What was the total amount spent on tickets (in Rs.) by Bipasha?
A 90
B 120
C 110
D 100

Solu. Consider Statement 2: Anjali took Ride-1 at 11 am after waiting for 30 minutes for Chitra to complete it. It was the only ride where Anjali waited. This implies that Chitra took Ride 1 at 10 am. Now we also know that she spent Rs 50 and that she left at 11 am. Now, since she did one ride costing Rs 20 at 10, she must have taken Ride-3 at 9 am.
So we get the following table for Chitra.

	Ride 3	Ride 1
Time	9 am- 10 am	10 am- 11 am
Cost	Rs 30	Rs 20

Now we know that Chitra and Anjali spent Rs 50 before 12:15 pm. It is not possible for Anjali to go on Ride-3 at 10 am as we know that she was waiting for 30 minutes before taking Ride-1 (She was waiting from 10:30 am).
Now, since we know that Ride-1 was the only ride for which she waited, we can say that she took Ride-1 at 11 am and started Ride-3 at 12 am
So we get the following table for Anjali.

	Ride-1	Ride-3
Time	11 am- 12 pm	12 pm - 1pm
Cost	20	30

Now, we know that Bipasha started her first ride at 11:30 am. We also know that they all spent Rs 50 before 12:15 pm.
Therefore, the first ride Bipasha takes will be Ride-2, costing Rs 50.
So we get the following table for Bipasha.

	Ride-2	
Time	11:30 am- 12:30am	
Cost	50	

We know that Ride 3 stops at 1 pm. So the last ride taken by Anjali will either be Ride-2 or Ride-4. Now, considering Statement 4, we know that the last ride taken by Anjali and Bipasha was same and that Bipasha rode it after Anjali. So their last ride can't be 2.
So the last ride of both Bipasha and Anjali will be 4.
Now if we assume that immediately after ending Ride-3, Anjali goes to Ride-4, then the last ride of Bipasha will be Ride-4 from 2 pm - 3 pm. But we know that Bipasha rode 3 rides. So this case is not possible.
Since Anjali didn't have any break or waiting time, the only ride she can ride at 1 pm will be Ride 2 and then she will go on Ride-4 from 2 pm to 3 pm.
So we get the following table for Anjali:

	Ride-1	Ride-3	Ride-2	Ride-4
Time	11 am- 12 pm	12 pm -1 pm	1 pm- 2 pm	2 pm- 3pm
Cost	20	30	50	40

Now we know that the last ride that Bipasha took was Ride-4 and that she had a gap of 1.5 hrs before it. This is only possible when she takes one ride between Ride-2 and Ride-4. Since Ride-3 is closed at 1 pm, she can only take Ride 1. So we get the following table for her.

	Ride-2	Ride-1	Break	Waiting time	Ride-4
Time	11:30 am-12:30 pm	12:30 pm- 1:30 pm	1:30 pm- 2:30 pm	2:30 pm to 3:00pm	3 pm - 4 pm
Cost	50	20			40

As we can see from the table for Bipasha, she spent a total of 50+20+40=110
Therefore the required answer is Option C: 110

Ques 7. Which were all the rides that Anjali completed by 2:00 pm?
A Ride-1 and Ride-3
B Ride-1, Ride-2, and Ride-3
C Ride-1, Ride-2, and Ride-4
D Ride-1 and Ride-4

Solu. 2
Consider Statement 2: Anjali took Ride-1 at 11 am after waiting for 30 minutes for Chitra to complete it. It was the only ride where Anjali waited. This implies that Chitra took Ride 1 at 10 am. Now we also know that she spent Rs 50 and that she left at 11 am. Now, since she did one ride costing Rs 20 at 10, she must have taken Ride-3 at 9 am.
So we get the following table for Chitra.

	Ride 3	Ride 1
Time	9 am- 10 am	10 am- 11 am
Cost	Rs 30	Rs 20

Now we know that Chitra and Anjali spent Rs 50 before 12:15 pm. It is not possible for Anjali to go on Ride-3 at 10 am as we know that she was waiting for 30 minutes before taking Ride-1 (She was waiting from 10:30 am).

Now, since we know that Ride-1 was the only ride for which she waited, we can say that she took Ride-1 at 11 am and started Ride-3 at 12 am
So we get the following table for Anjali.

	Ride-1	Ride-3
Time	11 am- 12 pm	12 pm - 1pm
Cost	20	30

Now, we know that Bipasha started her first ride at 11:30 am. We also know that they all spent Rs 50 before 12:15 pm.
Therefore, the first ride Bipasha takes will be Ride-2, costing Rs 50.
So we get the following table for Bipasha.

	Ride-2	
Time	11:30 am- 12:30am	
Cost	50	

We know that Ride 3 stops at 1 pm. So the last ride taken by Anjali will either be Ride-2 or Ride-4. Now, considering Statement 4, we know that the last ride taken by Anjali and Bipasha was same and that Bipasha rode it after Anjali. So their last ride can't be 2.
So the last ride of both Bipasha and Anjali will be 4.
Now if we assume that immediately after ending Ride-3, Anjali goes to Ride-4, then the last ride of Bipasha will be Ride-4 from 2 pm - 3 pm. But we know that Bipasha rode 3 rides. So this case is not possible.
Since Anjali didn't have any break or waiting time, the only ride she can ride at 1 pm will be Ride 2 and then she will go on Ride-4 from 2 pm to 3 pm.
So we get the following table for Anjali:

	Ride-1	Ride-3	Ride-2	Ride-4
Time	11 am- 12 pm	12 pm -1 pm	1 pm- 2 pm	2 pm- 3pm
Cost	20	30	50	40

Now we know that the last ride that Bipasha took was Ride-4 and that she had a gap of 1.5 hrs before it. This is only possible when she takes one ride between Ride-2 and Ride-4. Since Ride-3 is closed at 1 pm, she can only take Ride 1. So we get the following table for her.

	Ride-2	Ride-1	Break	Waiting time	Ride-4
Time	11:30 am-12:30 pm	12:30 pm- 1:30 pm	1:30 pm- 2:30 pm	2:30 pm to 3:00pm	3 pm - 4 pm
Cost	50	20			40

Anjali completed a total of 4 rides, 3 of which were completed at 2.
Therefore the answer is Option B: Ride-1, Ride 3, and Ride -2

Ques 8. Which ride was taken by all three visitors?
A Ride-1
B Ride-4
C Ride-3
D Ride-2

Solu. A
Consider Statement 2: Anjali took Ride-1 at 11 am after waiting for 30 minutes for Chitra to complete it. It was the only ride where Anjali waited. This implies that Chitra took Ride 1 at 10 am. Now we also know that she spent Rs 50 and that she left at 11 am. Now, since she did one ride costing Rs 20 at 10, she must have taken Ride-3 at 9 am.
So we get the following table for Chitra.

	Ride 3	Ride 1
Time	9 am- 10 am	10 am- 11 am
Cost	Rs 30	Rs 20

Now we know that Chitra and Anjali spent Rs 50 before 12:15 pm. It is not possible for Anjali to go on Ride-3 at 10 am as we know that she was waiting for 30 minutes before taking Ride-1 (She was waiting from 10:30 am).
Now, since we know that Ride-1 was the only ride for which she waited, we can say that she took Ride-1 at 11 am and started Ride-3 at 12 am
So we get the following table for Anjali.

	Ride-1	Ride-3
Time	11 am- 12 pm	12 pm - 1pm
Cost	20	30

Now, we know that Bipasha started her first ride at 11:30 am. We also know that they all spent Rs 50 before 12:15 pm.
Therefore, the first ride Bipasha takes will be Ride-2, costing Rs 50.
So we get the following table for Bipasha.

	Ride-2	
Time	11:30 am- 12:30am	
Cost	50	

We know that Ride 3 stops at 1 pm. So the last ride taken by Anjali will either be Ride-2 or Ride-4. Now, considering Statement 4, we know that the last ride taken by Anjali and Bipasha was same and that Bipasha rode it after Anjali. So their last ride can't be 2.
So the last ride of both Bipasha and Anjali will be 4.
Now if we assume that immediately after ending Ride-3, Anjali goes to Ride-4, then the last ride of Bipasha will be Ride-4 from 2 pm - 3 pm. But we know that Bipasha rode 3 rides. So this case is not possible.
Since Anjali didn't have any break or waiting time, the only ride she can ride at 1 pm will be Ride 2 and then she will go on Ride-4 from 2 pm to 3 pm.
So we get the following table for Anjali:

	Ride-1	Ride-3	Ride-2	Ride-4
Time	11 am- 12 pm	12 pm -1 pm	1 pm- 2 pm	2 pm- 3pm
Cost	20	30	50	40

Now we know that the last ride that Bipasha took was Ride-4 and that she had a gap of 1.5 hrs before it. This is only possible when she takes one ride between Ride-2 and Ride-4. Since Ride-3 is closed at 1 pm, she can only take Ride 1. So we get the following table for her.

	Ride-2	Ride-1	Break	Waiting time	Ride-4
Time	11:30 am-12:30 pm	12:30 pm- 1:30 pm	1:30 pm- 2:30 pm	2:30 pm to 3:00pm	3 pm - 4 pm
Cost	50	20			40

Only Ride-1 was taken by all the visitors. Therefore the correct answer is Option
A: Ride-1

Ques 9. How many rides did Anjali and Chitra take in total?

Solu. 6

Consider Statement 2: Anjali took Ride-1 at 11 am after waiting for 30 minutes for Chitra to complete it. It was the only ride where Anjali waited. This implies that Chitra took Ride 1 at 10 am. Now we also know that she spent Rs 50 and that she left at 11 am. Now, since she did one ride costing Rs 20 at 10, she must have taken Ride-3 at 9 am.

So we get the following table for Chitra.

	Ride 3	Ride 1
Time	9 am- 10 am	10 am- 11 am
Cost	Rs 30	Rs 20

Now we know that Chitra and Anjali spent Rs 50 before 12:15 pm. It is not possible for Anjali to go on Ride-3 at 10 am as we know that she was waiting for 30 minutes before taking Ride-1 (She was waiting from 10:30 am).

Now, since we know that Ride-1 was the only ride for which she waited, we can say that she took Ride-1 at 11 am and started Ride-3 at 12 am

So we get the following table for Anjali.

	Ride-1	Ride-3
Time	11 am- 12 pm	12 pm - 1pm
Cost	20	30

Now, we know that Bipasha started her first ride at 11:30 am. We also know that they all spent Rs 50 before 12:15 pm.

Therefore, the first ride Bipasha takes will be Ride-2, costing Rs 50.

So we get the following table for Bipasha.

	Ride-2	
Time	11:30 am- 12:30am	
Cost	50	

We know that Ride 3 stops at 1 pm. So the last ride taken by Anjali will either be Ride-2 or Ride-4. Now, considering Statement 4, we know that the last ride taken by Anjali and Bipasha was same and that Bipasha rode it after Anjali. So their last ride can't be 2.

So the last ride of both Bipasha and Anjali will be 4.

Now if we assume that immediately after ending Ride-3, Anjali goes to Ride-4, then the last ride of Bipasha will be Ride-4 from 2 pm - 3 pm. But we know that Bipasha rode 3 rides. So this case is not possible.
Since Anjali didn't have any break or waiting time, the only ride she can ride at 1 pm will be Ride 2 and then she will go on Ride-4 from 2 pm to 3 pm.
So we get the following table for Anjali:

	Ride-1	Ride-3	Ride-2	Ride-4
Time	11 am- 12 pm	12 pm -1 pm	1 pm- 2 pm	2 pm- 3pm
Cost	20	30	50	40

Now we know that the last ride that Bipasha took was Ride-4 and that she had a gap of 1.5 hrs before it. This is only possible when she takes one ride between Ride-2 and Ride-4. Since Ride-3 is closed at 1 pm, she can only take Ride 1. So we get the following table for her.

	Ride-2	Ride-1	Break	Waiting time	Ride-4
Time	11:30 am-12:30 pm	12:30 pm- 1:30 pm	1:30 pm- 2:30 pm	2:30 pm to 3:00pm	3 pm - 4 pm
Cost	50	20			40

Anjali took 4 rides, and Chitra took 2 rides. Therefore the correct answer is 6

Ques 10. What was the total amount spent on tickets (in Rs.) by Anjali?

Solu. 140
Consider Statement 2: Anjali took Ride-1 at 11 am after waiting for 30 minutes for Chitra to complete it. It was the only ride where Anjali waited. This implies that Chitra took Ride 1 at 10 am. Now we also know that she spent Rs 50 and that she left at 11 am. Now, since she did one ride costing Rs 20 at 10, she must have taken Ride-3 at 9 am.
So we get the following table for Chitra.

	Ride 3	Ride 1
Time	9 am- 10 am	10 am- 11 am
Cost	Rs 30	Rs 20

Now we know that Chitra and Anjali spent Rs 50 before 12:15 pm. It is not possible for Anjali to go on Ride-3 at 10 am as we know that she was

waiting for 30 minutes before taking Ride-1 (She was waiting from 10:30 am).
Now, since we know that Ride-1 was the only ride for which she waited, we can say that she took Ride-1 at 11 am and started Ride-3 at 12 am
So we get the following table for Anjali.

	Ride-1	Ride-3
Time	11 am- 12 pm	12 pm - 1pm
Cost	20	30

Now, we know that Bipasha started her first ride at 11:30 am. We also know that they all spent Rs 50 before 12:15 pm.
Therefore, the first ride Bipasha takes will be Ride-2, costing Rs 50.
So we get the following table for Bipasha.

	Ride-2	
Time	11:30 am- 12:30am	
Cost	50	

We know that Ride 3 stops at 1 pm. So the last ride taken by Anjali will either be Ride-2 or Ride-4. Now, considering Statement 4, we know that the last ride taken by Anjali and Bipasha was same and that Bipasha rode it after Anjali. So their last ride can't be 2.
So the last ride of both Bipasha and Anjali will be 4.
Now if we assume that immediately after ending Ride-3, Anjali goes to Ride-4, then the last ride of Bipasha will be Ride-4 from 2 pm - 3 pm. But we know that Bipasha rode 3 rides. So this case is not possible.
Since Anjali didn't have any break or waiting time, the only ride she can ride at 1 pm will be Ride 2 and then she will go on Ride-4 from 2 pm to 3 pm.
So we get the following table for Anjali:

	Ride-1	Ride-3	Ride-2	Ride-4
Time	11 am- 12 pm	12 pm -1 pm	1 pm- 2 pm	2 pm- 3pm
Cost	20	30	50	40

Now we know that the last ride that Bipasha took was Ride-4 and that she had a gap of 1.5 hrs before it. This is only possible when she takes one ride between Ride-2 and Ride-4. Since Ride-3 is closed at 1 pm, she can only take Ride 1. So we get the following table for her.

	Ride-2	Ride-1	Break	Waiting time	Ride-4
Time	11:30 am-12:30 pm	12:30 pm- 1:30 pm	1:30 pm- 2:30 pm	2:30 pm to 3:00pm	3 pm - 4 pm
Cost	50	20			40

As we can see from the table of Anjali she spent a total of 20 + 30 + 50 + 40 = 140 Therefore the required answer is 140

Ques 11. What is Akhil's score on Day 1?

A 5

B 7

C 6

D 8

Solu. B

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.

The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 eq(3), d4+d5 = 34 ... eq(4)

It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a

tie.

It is given that the total score on Day 3 is the same as the total score on Day 4. Therefore, d3 = d4 => d3d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.

The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that Chatur always scores in multiples of 3. His score on Day 2 is the unique highest score in the competition. His minimum score is observed only on Day 1, and it matches Akhil's score on Day 4.
Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.
Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, $6+2x = 16 \Rightarrow x = 5$
The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.
From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.
Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b
=> a+b =6, and a> b
Hence, the value of a can be 4/5, and the value of b can be 2/1
Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil	7	4/5	5	3	5/4
Bimal	5	2/1	5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From the table, we can see that the score of Akhil is 7 on day 1.
The correct option is B

Ques 12. Who attains the maximum total score?
A Cannot be determined
B Akhil
C Bimal
D Chatur

Solu.

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.
The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 eq(3), d4+d5 = 34 ... eq(4)
It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a
tie.
It is given that the total score on Day 3 is the same as the total score on Day 4. Therefore, d3 = d4 => d3d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.
The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that Chatur always scores in multiples of 3. His score on Day 2 is the unique highest score in the competition. His minimum score is observed only on Day 1, and it matches Akhil's score on Day 4.
Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.
Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, 6+2x = 16 => x = 5

The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.

From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.

Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b

=> a+b =6, and a> b

Hence, the value of a can be 4/5, and the value of b can be 2/1

Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total score
Akhil	7	4/5	5	3	5/4	23/24/25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total Score	15	15	16	16	18	80

From the table, we can see that the maximum score is obtained by Chatur.
The correct option is D

Ques 15. If Akhil attains a total score of 24, then what is the total score of Bimal?

Solu.

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.
The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 eq(3), d4+d5 = 34 ... eq(4)
It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a
tie.
It is given that the total score on Day 3 is the same as the total score on Day 4. Therefore, d3 = d4 => d3d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.
The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that Chatur always scores in multiples of 3. His score on Day 2 is the unique highest score in the competition. His minimum score is observed only on Day 1, and it matches Akhil's score on Day 4.
Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.
Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, $6+2x = 16 \Rightarrow x = 5$
The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.
From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.
Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b
=> a+b =6, and a> b
Hence, the value of a can be 4/5, and the value of b can be 2/1
Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total score
Akhil	7	4/5	5	3	5/4	23/24/25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total Score	15	15	16	16	18	80

In the question, it is given that the score obtained by Akhil is 24, which implies the score obtained by Bimal is 26.
The answer is 26

Ques 17. How many boxes have at least one sack containing 9 coins?
A 3
B 4
C 5
D 8

Solu. 5

We are given that each box contains three sacks. Each sack has a certain number of coins, between 1 and 9, both inclusive.
The average number of coins per sack in the boxes are all distinct integers.
The total number of coins in each row is the same. The total number of coins in each column is also the same. => The total number of coins in a box range from 3 (1+1+1) to 27 (9+9+9) Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45. => Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)
Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.
We are given 2 clues => Table-1 & Table-2
Consider bag (3,1)
=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also => There is a 9 in one of the sacks.
=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c +8 +9 should be a multiple of 3 => c = 7 is the only possiblility.
=> bag (3,1) has 7, 8, 9 coins with average = 8.
Consider bag (2,1)
Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.
=> 1, 2, 9 are the coins in bag (2,1) with average = 4
Consider bag (1,2)
Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)

=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5
=> c = 3 for c + 18 to be a multiple of 3.
=> 3, 9, 9 are the coins in bag (1,2) with average = 7.
Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.
From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)
Avg = 3, 1 sack has more than 5 and **=> 2 conditions are being satisfied.
=> (can't be condition- 3 =>9 coins as the total sum of coins is it self 3^ * 3 = 9 => bag (1,1) has 1, 1, 7 coins with average = 3.
Consider bag (1,3)
Avg. = 5 => Sum = 15.
Median = 6 and 2 sacks have more than 5 and *=> (1 condition is satisfied)
Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15
=> 1 ,6; c are the coins => For sum =15 => c = 15 - 1 - 6 = 8 => bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)

0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.
=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.
But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*
=> bag (3,3) has 1, 1, 1 coins with average = 1.
Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.
In bag (2,2) => Avg,=2 => Sum = 6 and only 1* => smallest elemens=t should be 1.
=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5=> 2 + 3 = 5 is the only possibility.
=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)
Avg. = 6 => Sum = 18.
2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins. => bag (3,2) has 1, c, 9 coins and c = 18-1-9=8 => bag (3,2) has 1, 8, 9 coins with average = 6 coins.
==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Bags (2,1), (3,1), (1,2), (3,2), (2,3) have at least 1 sack with 9 coins. => Total of 5 bags.

Ques 20. In how many boxes do all three sacks contain different numbers of coins?

Solu. 5

We are given that each box contains three sacks. Each sack has a certain number of coins, between 1 and 9, both inclusive.

The average number of coins per sack in the boxes are all distinct integers. The total number of coins in each row is the same. The total number of coins in each column is also the same. => The total number of coins in a box range from 3 (1+1+1) to 27 (9+9+9) Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45. => Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)

Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.

We are given 2 clues => Table-1 & Table-2

Consider bag (3,1)

=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also => There is a 9 in one of the sacks.
=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c +8 +9 should be a multiple of 3 => c = 7 is the only possiblility.
=> bag (3,1) has 7, 8, 9 coins with average = 8.
Consider bag (2,1)
Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.
=> 1, 2, 9 are the coins in bag (2,1) with average = 4
Consider bag (1,2)
Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)
=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5
=> c = 3 for c + 18 to be a multiple of 3.
=> 3, 9, 9 are the coins in bag (1,2) with average = 7.
Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.
From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)
Avg = 3, 1 sack has more than 5 and **=> 2 conditions are being satisfied.
=> (can't be condition- 3 =>9 coins as the total sum of coins is it self 3^ * 3 = 9 => bag (1,1) has 1, 1, 7 coins with average = 3.
Consider bag (1,3)
Avg. = 5 => Sum = 15.

Median = 6 and 2 sacks have more than 5 and *=> (1 condition is satisfied)
Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15
=> 1 ,6; c are the coins => For sum =15 => c = 15 - 1 - 6 = 8 => bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)
0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.
=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.
But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*
=> bag (3,3) has 1, 1, 1 coins with average = 1.
Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.
In bag (2,2) => Avg,=2 => Sum = 6 and only 1* => smallest elemens=t should be 1.
=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5=> 2 + 3 = 5 is the only possibility.
=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)
Avg. = 6 => Sum = 18.
2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins. => bag (3,2) has 1, c, 9 coins and c = 18-1-9=8 => bag (3,2) has 1, 8, 9 coins with average = 6 coins.
==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Bags with different number of coins in all 3 sacks are (2,1), (3,2), (2,2), (3,2), (1,3) => 5 bags.