



CDC 05 2022 DILR

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Section-1

Sec 1

Direction for questions 1 to 4: Answer the questions on the basis of the information given below.

Rita, is creating a C++ program for a project. The program has to be designed in a way that it categorizes numbers in a cell of a square layout of 5×5 grid as - right, left, up and down - visible cells. The cells which are not categorised as either right, left, up or down visible cells are called dud cells. Rows are numbered 1 to 5 from top to bottom and columns 1 to 5 from left to right. A 5×5 grid is as shown below:

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

Further, it is also known that:

- (i) A cell with number, a, in a row is right visible if all the numbers in the cell to the right of number a, in the same row are strictly smaller than a. A cell with number, b, is left-visible if all the numbers in the cells to the left of the number b, in the same row is strictly smaller than b.
- (ii) A cell with number, c, in a column is up-visible if all the numbers in the cells to the upper side of number c in the same column are strictly smaller than c. A cell with number, d, is down-visible if all the numbers in the cell to the lower side of the number in the same column is strictly smaller than d.

Q.1 [11831809]

How many cells in the grid can be categorized as only one type of visible cell?

Solution:

Correct Answer : 9

[Answer key/Solution](#)

Step 1:

Let us consider the first row:

1	7	6	9	3
---	---	---	---	---

Here, the first cell,

1

All numbers to the right are greater than 1, and all numbers in the cell to the down side are also greater than 1, therefore, this cell is neither right nor down visible. Hence, this cell is a dud cell.

Similarly, next cell in the row,

7

Is only left – visible.

Step 2:

Up-visible, down-visible, left-visible and right visible are represented by UV, DV, LV and RV respectively.

From condition (i) and (ii), we can categorize each cell as following:

The cells with yellow colour are dud cells.

1	7 LV	6 DV	9 RV, LV, DV	3
3 UV	9 RV, LV, UV, DV	5 RV, DV	2 RV	1
7 UV	8 LV, RV, DV	4 DV	5	6 UV, DV
9 RV, UV, DV	5 DV	3 DV	8 RV, DV	2
6 RV	1	2	3	4

Nine cells in the grid can be categorized as only one type of visible cell.

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Q.2 [11831809]

Which of the following is true for any cell with number 9 in this grid?

- 1 ☐ The cell is categorized as right, left, up and down – visible cell.
- 2 ☐ The cell can be categorized as atleast 3 types of visible cell.
- 3 ☐ The cell can be categorized as atmost 3 types of visible cell.
- 4 ☐ The cell can be categorized as exactly 3 types of visible cell.
-

Solution:

Correct Answer : 2

[Answer key/Solution](#)

Step 1:

Let us consider the first row:

1	7	6	9	3
---	---	---	---	---

Here, the first cell,

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Similarly, next cell in the row,

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Step 2:

Up-visible, down-visible, left-visible and right visible are represented by UV, DV, LV and RV respectively.

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3 UV	9 RV, LV, UV, DV	5 RV, DV	2 RV	1
7 UV	8 LV, RV, DV	4 DV	5	6 UV, DV
9 RV, UV, DV	5 DV	3 DV	8 RV, DV	2
6 RV	1	2	3	4

Any cell with number 9, categorizes as atleast three types of visible cells.

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Q.3 [11831809]

We can find two dud cells in

1 ☐ the 5th column

2 ☐ the 3rd row

3 ☐ the 4th column

4 ☐ the 5th row

Solution:

Correct Answer : 3

[Answer key/Solution](#)

Step 1:

Let us consider the first row:

1	7	6	9	3
---	---	---	---	---

Here, the first cell,

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7 UV	8 LV, RV, DV	4 DV	5	6 UV, DV
9 RV, UV, DV	5 DV	3 DV	8 RV, DV	2
6 RV	1	2	3	4

In the 4th column, there are two dud cells.

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Q.4 [11831809]

Which of the following statements is true about this grid?

- 1 ☐ Each row has a cell which can be categorised as atleast two types of visible cell.
- 2 ☐ Each column has at least two cells which can be categorised as equal number of types of visible cells.
- 3 ☐ Each row has at least one dud cell.
- 4 ☐ All cells with number 3 can be categorised as atleast one type of visible cell.
-

Solution:

Correct Answer : 3

[Answer key/Solution](#)

Step 1:

Let us consider the first row:

1	7	6	9	3
---	---	---	---	---

Here, the first cell,

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All numbers to the right are greater than 1, and all numbers in the cell to the down side are also greater than 1, therefore, this cell is neither right nor down visible. Hence, this cell is a dud cell.

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3 UV	9 RV, LV, UV, DV	5 RV, DV	2 RV	1
7 UV	8 LV, RV, DV	4 DV	5	6 UV, DV
9 RV, UV, DV	5 DV	3 DV	8 RV, DV	2
6 RV	1	2	3	4

Each row has at least one dud cell.

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FeedBack

Directions for questions 5 to 10: Answer the questions on the basis of the information given below.

A report by a consulting firm gave details of resources used by the top four OTT platforms for their shows. The resource categories are Actors, Writers, and Production units. All resource costs are calculated in terms of the *cost per episode*.

It is known that the spending/costs on each of these three categories can be sub-categorized into two grades, Grade I and Grade II. Grade I spending represents the spending on more expensive resources whereas Grade II spending includes resources that cost less. The total cost is a sum of the costs spent on all resources combined.

It is known that an actor that falls under Grade I charges Rs. 20,000 per episode (on average) whereas the one that falls under Grade II charges Rs. 8,000 per episode on average. A Writer from Grade I charges Rs. 6,000 per episode whereas one from Grade II charges Rs.3,000 per episode. Production units cost Rs. 50,000 and Rs. 36,000 for Grade I and II respectively.

It is known that every OTT platforms hires at least 2 writers, 2 actors, and 1 Production unit each per episode from the two grades combined. It is also known that no platform hires more than 5 resources in total from any category.

Table 1 gives the data on how many actors, writers and production teams are required by each OTT platform although some data could not be compiled and is missing from the table. **Table 2** gives the revenue earned per episode by these platforms. Earning Per Episode (**EPP**) is defined as the difference between the Revenue and the total cost. All four platforms have an EPP that is not less than Rs. 20,000 and not more than Rs. 40,000.

Table 1

	NUMBER OF RESOURCES NEEDED PER EPISODE					
	Actors		Writers		Production team	
	Grade I	Grade II	Grade I	Grade II	Grade I	Grade II
Family Prime	-	2	-	2	1	1
Crass Flix	3	-	1	-	-	-
Toney Liv	2	-	1	3	-	-
Zeendabad	1	-	0	-	-	2

Table 2

OTT PLATFORM	REVENUE PER EPISODE
Family Prime	Rs. 1.8 lakh
Crass Flix	Rs. 2.2 lakh
Toney Liv	Rs. 1.8 lakh
Zeendabad	Rs. 1.5 lakh

Q.5 [11831809]

If Family Prime hired 3 Grade I writers, how many Grade I actor(s) was/were hired by Family Prime?

Solution:

Correct Answer : 1

 **Answer key/Solution**

Let Grade I actors hired by Family Prime be 'n'.

Total cost for Family Prime = Revenue – EPP = 1.8 lakh – (0.2 to 0.4 lakh) =

Between 1.4 lakh and 1.6 lakh

Costs incurred by Family Prime = Cost on actors + cost on writers + cost on production

= $n \times 20,000 + 2 \times 8,000 + 3 \times 6,000 + 2 \times 3,000 + 50,000 + 36,000 = 20000n + 1,26,000$

Since the total cost is between 1.4 lakh and 1.6 lakh.

Therefore, $n = 1$

Hence, 1 Grade I actor was hired by Family Prime.

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Zeendabad	1	-	0	-	-	2

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Toney Liv	Rs. 1.8 lakh
Zeendabad	Rs. 1.5 lakh

Q.6 [11831809]

What was the maximum number of Grade I production units that Crass Flix could hire?

1 ☐ 1

2 ☐ 2

3 ☐ 3

4 ☐ More than 3

Solution:

Correct Answer : 2

Let Grade I production units hired by Crass Flix be 'n'.

Total cost for Crass Flix = Revenue – EPP = 2.2 lakh – (0.2 to 0.4 lakh) = Between 1.8 lakh and 2 lakh

Costs incurred by Crass Flix = Cost on actors + cost on writers + cost on production

$$= 3 \times 20,000 + 0 \times 8,000 + 1 \times 6,000 + 1 \times 3,000 + n \times 50,000 + n \times 36,000$$

$$= 69,000 + n \times 50,000$$

$$\text{Therefore, } 1,80,000 < 69,000 + n \times 50,000 < 2,00,000$$

$$\text{Or, } 1,11,000 < n \times 50,000 < 1,31,000$$

$$\text{Or, } 2.2 < n < 2.62$$

So maximum n can be 2.

Hence, the maximum 2 Grade I production units that Crass Flix could hire.

 Answer key/Solution

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FeedBack

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Zeendabad	Rs. 1.5 lakh

Q.7 [11831809]

The maximum number of Grade I production units that can be hired by Tony Liv is

1 ☐ 0

2 ☐ 1

3 ☐ 3

4 ☐ 2

Solution:

Correct Answer : 4

 Answer key/Solution

**TOTAL COST FOR Toney Liv = Revenue – EPP = 1.8 lakh – (0.2 to 0.4 lakh) =
Between 1.4 lakh to 1.6 lakh**

Costs incurred by Toney Liv = Cost on actors + cost on writers + cost on production

Cost on Actors = $2 \times 20,000 + \text{No. of grade II actors} \times 8,000$

Cost on writers = $1 \times 6,000 + 3 \times 3,000 = 15,000$

Cost on Production = At least 1 (grade I or II)

As the total cost for the platform lies within a known range, we can make assumptions on the number of Grade I

production units. The basic conditions, of hiring at least 1 production unit and not more than 5 resources (actors) must however be met.

Case I: Hiring 0 Production Units of Grade I

Total cost = $(40,000 + \text{No. of grade II actors} \times 8,000) + (15,000) + \text{Grade II}$

Production = $55,000 + \text{No. of grade II actors} \times 8,000 + \text{Production cost}$

If we hire 2 Grade II production units (= Rs. 72,000), and either 2 or 3 grade II actors, total cost will lie in the desired range.

Thus, hiring NO grade I production unit is possible.

Case II: Hiring 1 Production Units of Grade I

Total cost = $55,000 + \text{No. of grade II actors} \times 8,000 + \text{Production cost}$

If we hire 1 Grade I and 1 Grade II production units (= Rs. 86,000), the total cost will lie in the desired range.

Thus, hiring ONE grade I production unit is possible.

Case III: Hiring 2 Production Units of Grade I

Total cost = $55,000 + \text{No. of grade II actors} \times 8,000 + \text{Production cost}$

If we hire 2 Grade I production units (= Rs. 1 lakh), the total cost will lie in the desired range if we don't hire any grade II actors.

Thus, hiring TWO grade I production units is possible.

Hence, the maximum number of Grade I production units that can be hired by Toney Liv is 2.

Bookmark

FeedBack

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Q.8 [11831809]

If Family Prime has to restrict its total cost at most Rs. 1.6 lakh per episode, then in how many combinations can it hire actors and writers?

1 ☐ 3

2 ☐ 4

3 ☐ 6

4 ☐ 5

Solution:

Correct Answer : 4

Total cost for Family Prime = Between 1.6 lakh and 1.4 lakh both inclusive (to EPP lies in the given range) = Cost on

actors + cost on writers + cost on production

Cost on actors = $2 \times 8,000 + \text{No of Grade I} \times 20,000$

Cost on writers = $2 \times 3,000 + \text{No of Grade I} \times 6,000$

Cost on Production = $1 \times 50,000 + 1 \times 36,000 = 86,000$

Total Cost for Family Prime = Sum of the above costs = $1,08,000 + \text{No. of Grade I actors} \times 20,000 + \text{No of Grade I$

writers $\times 6,000$

The maximum number of actors and writers that can be hired is 3 more to ensure that the number doesn't cross 5 for either category.

Case I: Hiring NO Grade I actor and THREE Grade I writers

Total cost = $1,08,000 + 0 \times 20,000 + 3 \times 6,000 = 1,26,000 = \text{Less than the minimum amount}$

Thus, hiring NO grade I actors is NOT possible.

Case II: Hiring ONE Grade I actor and TWO OR THREE Grade I writers

Total cost = $1,08,000 + 1 \times 20,000 + 2/3 \times 6,000 = 1,40,000 / 1,46,000$ (both in acceptable range)

Thus, hiring ONE grade I actor and TWO or THREE grade I writers is possible = 2 acceptable combinations

Case III: Hiring TWO Grade I actors and 0/1/2 Grade I writers

Total cost = $1,08,000 + 2 \times 20,000 + 0/1/2 \times 6,000 = 1,48,000 / 1,54,000 / 1,60,000$ (all in acceptable range)

Thus, hiring TWO grade I actors with grade I writers is possible = 3 acceptable combinations

Hence, TOTAL NUMBER OF ACCEPTABLE COMBINATIONS = 5.

 Answer key/Solution

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Toney Liv	2	-	1	3	-	-
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Table 2

OTT PLATFORM	REVENUE PER EPISODE
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Zeendabad	Rs. 1.5 lakh

Q.9 [11831809]

If Zeendabad decides not to use any Grade I resources for writing or Production, what is the maximum number of Grade II actors it can hire and still ensure that it's Earning per episode exceeds 20% of the total cost?

Solution:

Correct Answer : 3

 Answer key/Solution

To ensure EPP is at least 20% of total cost, Revenue = 1.5 lakh \geq 120% of total cost

Thus, total cost \leq Rs. 1.25 lakh

To ensure EPP is less than Rs. 40,000,

1.1 lakh \leq Total cost \leq 1.25 lakh

Total Cost for Zeendabad = $1 \times 20,000 + \text{No. of Grade II actors} \times 8,000 + \text{Grade II writers} \times 3,000 + 72,000$
(production)

= $92,000 + \text{No. of Grade II actors} \times 8,000 + \text{Grade II writers} \times 3,000$

To maximize the the number of actors, we must minimize the number of writers. However, at least writers must hired.

Therefore,

Total Cost for Zeendabad = $92,000 + \text{No. of Grade II actors} \times 8,000 + 2 \times 3,000 = 98,000 + \text{No. of Grade II actors} \times 8,000$

Hence, it is clear that a maximum of 3 grade II actors can be hired by the platform.

Bookmark

FeedBack

Directions for questions 5 to 10: Answer the questions on the basis of the information given below.

A report by a consulting firm gave details of resources used by the top four OTT platforms for their shows. The resource categories are Actors, Writers, and Production units. All resource costs are calculated in terms of the *cost per episode*.

It is known that the spending/costs on each of these three categories can be sub-categorized into two grades, Grade I and Grade II. Grade I spending represents the spending on more expensive resources whereas Grade II spending includes resources that cost less. The total cost is a sum of the costs spent on all resources combined.

It is known that an actor that falls under Grade I charges Rs. 20,000 per episode (on average) whereas the one that falls under Grade II charges Rs. 8,000 per episode on average. A Writer from Grade I charges Rs. 6,000 per episode whereas one from Grade II charges Rs.3,000 per episode. Production units cost Rs. 50,000 and Rs. 36,000 for Grade I and II respectively.

It is known that every OTT platforms hires at least 2 writers, 2 actors, and 1 Production unit each per episode from the two grades combined. It is also known that no platform hires more than 5 resources in total from any category.

Table 1 gives the data on how many actors, writers and production teams are required by each OTT platform although some data could not be compiled and is missing from the table. **Table 2** gives the revenue earned per episode by these platforms. Earning Per Episode (**EPP**) is defined as the difference between the Revenue and the total cost. All four platforms have an EPP that is not less than Rs. 20,000 and not more than Rs. 40,000.

Table 1

	NUMBER OF RESOURCES NEEDED PER EPISODE					
	Actors		Writers		Production team	
	Grade I	Grade II	Grade I	Grade II	Grade I	Grade II
Family Prime	-	2	-	2	1	1
Crass Flix	3	-	1	-	-	-
Toney Liv	2	-	1	3	-	-
Zeendabad	1	-	0	-	-	2

Table 2

OTT PLATFORM	REVENUE PER EPISODE
Family Prime	Rs. 1.8 lakh
Crass Flix	Rs. 2.2 lakh
Toney Liv	Rs. 1.8 lakh
Zeendabad	Rs. 1.5 lakh

Q.10 [11831809]

The sum of the maximum possible EPP and the minimum possible EPP for Crass Flix must be

- 1 ☐ More than Rs. 56,000
- 2 ☐ Between Rs. 56,000 and Rs. 47,000
- 3 ☐ Between Rs. 47,000 and Rs. 42,000
- 4 ☐ Less than Rs. 42,000

Solution:

Correct Answer : 1

TOTAL EPP FOR Crass Flix = Revenue – Total cost (should lie between 1.8 and 2 lakh)

Total cost = 60,000 + 6,000 + No. of grade II actors × 8,000 + No. of grade II writers × 3,000 + Production cost

To maximize EPP 2 actors and 4 writers can be hired, and 1 grade I and II production units each will ensure

Total cost = 1.8 lakh

EPP in such a case = Rs. 40,000 (maximum possible)

To minimize EPP, 1 grade I and 2 grade II production units each, along with 4 grade II writers will ensure

Total cost = 2 lakh

EPP in such a case = Rs. 20,000 (minimum possible)

Hence, maximum possible sum = Rs. 60,000.

Bookmark

FeedBack

 Answer key/Solution

Direction for questions 11 to 14: Answer the questions on the basis of the information given below.

Only four different types of food crops – Millets, Pulses, Rice and Wheat – were produced in a state of the country. The table given below shows the production of a crop as a percentage of the total production of four crops in the state during the period 2018-19 to 2021-22.

Crop	2018-19	2019-20	2020-21	2021-22
Millets		20	25	15
Pulses	20		20	15
Rice	25	30		40
Wheat	40	35	25	

Q.11 [11831809]

If production of Rice as compared to the previous year increased by 25%, 20% and 33.33% in 2019-20, 2020-21 and 2021-22 respectively, then what was the percentage change in the production of Millets from 2018-19 to 2021-22?

1 ☐ 20%

2 ☐ 25%

3 ☐ 30%

4 ☐ 35%

Solution:

Correct Answer : 2

 Answer key/Solution

Crop	2018-19	2019-20	2020-21	2021-22
Millets	15	20	25	15
Pulses	20	15	20	15
Rice	25	30	30	40
Wheat	40	35	25	30

Let the total production of crops in the state in 2018-19 be 100x.

Then, production of rice in 2018-19 = 25x and production of Millets in 2018-19 = 15x

Production of rice in 2021-22 = $25x \times \frac{5}{4} \times \frac{6}{5} \times \frac{4}{3} = 50x$

So production of Millets in 2021-22 = $50x/40 \times 15 = 18.75x$

Hence, required percentage increase = $(18.75x - 15x)/15x \times 100 = 25\%$.

Bookmark

FeedBack

Direction for questions 11 to 14: Answer the questions on the basis of the information given below.

Only four different types of food crops – Millets, Pulses, Rice and Wheat – were produced in a state of the country. The table given below shows the production of a crop as a percentage of the total production of four crops in the state during the period 2018-19 to 2021-22.

Crop	2018-19	2019-20	2020-21	2021-22
Millets		20	25	15
Pulses	20		20	15
Rice	25	30		40
Wheat	40	35	25	

Q.12 [11831809]

If the production of wheat was same in the four years, then in which year(s) the percentage change in the total production of crops in the state was highest as compared to the previous year?

1 ☐ 2019-2020

2 ☐ 2021-22

3 ☐ 2020-21

4 ☐ Both (2) & (3)

Solution:

Correct Answer : 3

[Answer key/Solution](#)

Crop	2018-19	2019-20	2020-21	2021-22
Millets	15	20	25	15
Pulses	20	15	20	15
Rice	25	30	30	40
Wheat	40	35	25	30

Let the total production of crops in 2018-19, 2019-20, 2020-21 and 2021-22 be P1, P2, P3 and P4.

Then, $0.4P1 = 0.35P2 = 0.25P3 = 0.3P4$

$\Rightarrow P1 : P2 = 7 : 8$; $P2 : P3 = 5 : 7$; $P3 : P4 = 6 : 5$

Hence, clearly, the percentage change in the total production is the highest in 2020-21.

Bookmark

FeedBack

Direction for questions 11 to 14: Answer the questions on the basis of the information given below.

Only four different types of food crops – Millets, Pulses, Rice and Wheat – were produced in a state of the country. The table given below shows the production of a crop as a percentage of the total production of four crops in the state during the period 2018-19 to 2021-22.

Crop	2018-19	2019-20	2020-21	2021-22
Millets		20	25	15
Pulses	20		20	15
Rice	25	30		40
Wheat	40	35	25	

Q.13 [11831809]

If the ratio of the total production of all the four crops in the years 2018-19, 2019-20, 2020-21 and 2021-22 was 4 : 2 : 2 : 3 respectively, then the total production of which of the following crops in the state was the least during the period 2018-19 to 2021-22?

1 ☐ Millets

2 ☐ Pulses

3 ○ Rice

4 ○ Both (1) & (2)

Solution:

Correct Answer : 4

 Answer key/Solution

Crop	2018-19	2019-20	2020-21	2021-22
Millets	15	20	25	15
Pulses	20	15	20	15
Rice	25	30	30	40
Wheat	40	35	25	30

Let the total production of all the four crops in the years 2018-19, 2019-20, 2020-21 and 2021-22 be $4x$, $2x$, $2x$ and $3x$ respectively.

Crop	2018-19	2019-20	2020-21	2021-22	Total
Millets	$0.6x$	$0.4x$	$0.5x$	$0.45x$	$1.95x$
Pulses	$0.8x$	$0.3x$	$0.4x$	$0.45x$	$1.95x$
Rice	x	$0.6x$	$0.6x$	$1.2x$	$3.4x$
Wheat	$1.6x$	$0.7x$	$0.5x$	$0.9x$	$3.7x$
Total	$4x$	$2x$	$2x$	$3x$	

Hence, the total production was the least of both Millets and Pulses.

Bookmark

FeedBack

Direction for questions 11 to 14: Answer the questions on the basis of the information given below.

Only four different types of food crops – Millets, Pulses, Rice and Wheat – were produced in a state of the country. The table given below shows the production of a crop as a percentage of the total production of four crops in the state during the period 2018-19 to 2021-22.

Crop	2018-19	2019-20	2020-21	2021-22
Millets		20	25	15
Pulses	20		20	15
Rice	25	30		40
Wheat	40	35	25	

Q.14 [11831809]

The selling price of pulses increased by 20% and the cost price of pulses by 65% from 2019-20 to 2020-21. The net profit (in Rs.) from the sale of pulses was the same in 2019-20 and 2020-21. If the total production of all the four crops (in kg) in the state in 2019-20 and 2020-21 was the same, then the ratio of the selling price to the cost price of pulses in 2019-20 was

1 ☐ 2 : 1

2 ☐ 3 : 2

3 ☐ 3 : 1

4 ☐ 4 : 3

Solution:

Correct Answer : 1

 Answer key/Solution

Crop	2018-19	2019-20	2020-21	2021-22
Milets	15	20	25	15
Pulses	20	15	20	15
Rice	25	30	30	40
Wheat	40	35	25	30

Let the total production in 2019-20 as well as in 2020-21 be $100x$.

Then, production of Pulses in 2019-20 and 2020-21 were $15x$ and $20x$ respectively.

Let cost price per kg in 2019-20 be C .

Then, cost price per kg in 2020-21 = $1.65C$

Let selling price per kg in 2019-20 be S .

Then, selling price per kg in 2020-21 = $1.2S$

Therefore, $(S - C) \times 15x = (1.2S - 1.65C) \times 20x$

$\Rightarrow 3S - 3C = 4.8S - 6.6C$

$\Rightarrow 3.6C = 1.8S \Rightarrow S : C = 2 : 1$.

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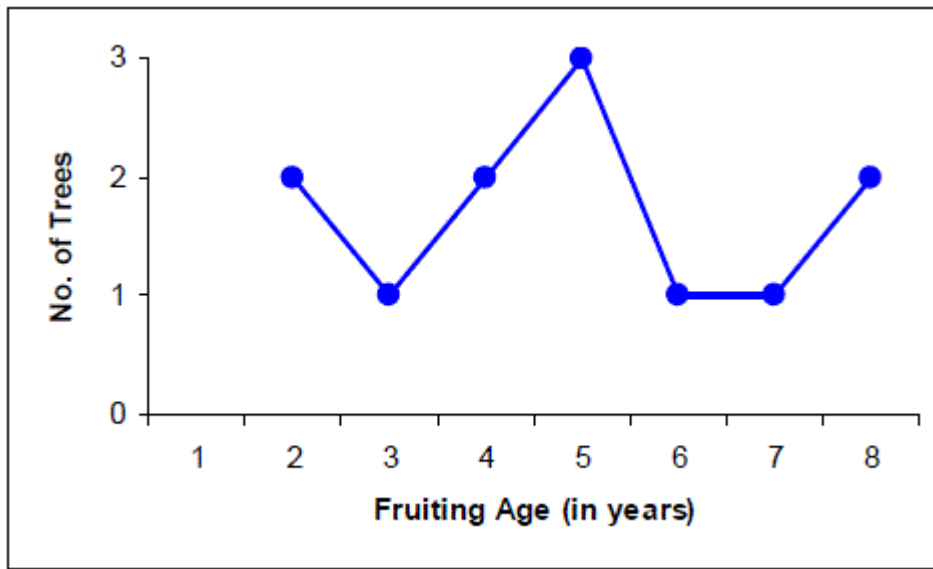
FeedBack

Directions for questions 15 to 20: Answer the questions on the basis of the information given below.

Hariram, a farmer planted 12 trees, numbered 1 to 12, in his field. After taking good care of them, Hariram noticed that within a few years they started bearing fruits. The line graph given below shows the fruiting age (in years) of 12 trees. For any tree, the fruiting age (in years) is an integer. The fruiting age is 2 or 3 or 4 years for a guava tree, 5 or 6 years for a mango tree and 7 or 8 years for an apple tree.

Further, the following are known.

- (i) Odd-numbered trees are not guava trees; Even-numbered trees are not mango trees and trees, whose numbers are divisible by 4 are not apple trees.
- (ii) The fruiting age of all the trees, numbered 5 to 11, is different, with tree 9 requiring a maximum fruiting age and tree 10 requiring a minimum fruiting age.
- (iii) No three consecutive odd numbered trees are mango trees. The fruiting age of tree 11 is an even number.



Q.15 [11831809]

Which of the following tree numbers is NOT a guava tree?

1 ☐ 4

2 ☐ 12

3 ☐ 6

4 ☐ 2

Solution:

Correct Answer : 4

[Answer key/Solution](#)

Step 1:

From the line graph, 5 are guava trees, 4 are mango trees and 3 are apple trees. The given information can be shown in the following table.

Fruiting age (in years)	2	3	4	5	6	7	8
No. of Trees	2	1	2	3	1	1	2
	Guava			Mango		Apple	

From condition (i), Even numbered trees are guava trees. Odd numbered trees are mango trees. Trees numbered 4, 8 and 12 are not apple trees.

So, trees numbered 4, 8 and 12 are guava trees.

Step 2:

From condition (ii), The fruiting age of all the trees, numbered 5 to 11, is different i.e., 2, 3, 4, 5, 6, 7, 8 years. The fruiting age of tree 9 is 8 years and that of tree 10 is 2 years.

So tree 9 is an apple tree and tree 10 is a guava tree. Tree 6 will be a guava tree and tree 2 will be an apple tree. The fruiting age of tree 2 will be 8 years.

Since the fruiting age of three trees is 5 years. Hence, trees 1 and 3 will be mango trees and their fruiting age will be 5 years.

Step 3:

From condition (iii), Since no three consecutive odd numbered trees are mango trees. Hence, tree 5 will be an apple tree and its fruiting age will be 7 years. So trees 7 and 11 would be mango trees.

Also, from condition (iii), The fruiting age of tree 11 will be 6 i.e., even number.

All the information can be shown in the following table.

Tree No.	1	2	3	4	5	6	7	8	9	10	11	12
Guava	×	×	×	✓	×	✓	×	✓	×	✓	×	✓
Mango	✓	×	✓	×	×	×	✓	×	×	×	✓	×
Apple	×	✓	×	×	✓	×	×	×	✓	×	×	×
Fruiting Age (in years)	5	8	5	2 or 4	7	3 or 4	5	4 or 3	8	2	6	4 or 2

The tree 2 is NOT a guava tree.

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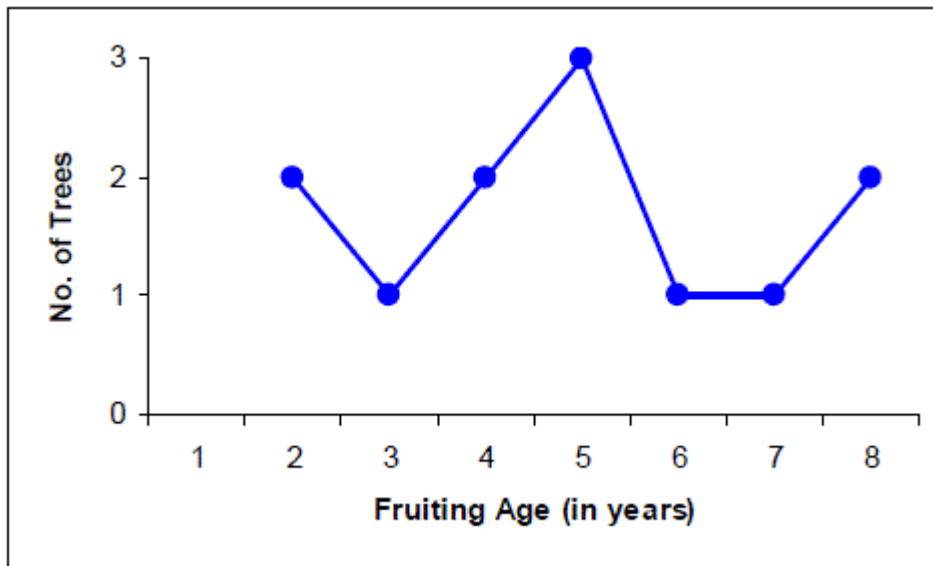
FeedBack

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Further, the following are known.

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- (ii) The fruiting age of all the trees, numbered 5 to 11, is different, with tree 9 requiring a maximum fruiting age and tree 10 requiring a minimum fruiting age.
- (iii) No three consecutive odd numbered trees are mango trees. The fruiting age of tree 11 is an even number.



Q.16 [11831809]

What can be the maximum difference (in years) between the fruiting ages of tree 3 and tree 12?

Solution:

Correct Answer : 3

[Answer key/Solution](#)

Step 1:

From the line graph, 5 are guava trees, 4 are mango trees and 3 are apple trees. The given information can be shown in the following table.

Fruiting age (in years)	2	3	4	5	6	7	8
No. of Trees	2	1	2	3	1	1	2
	Guava			Mango		Apple	

From condition (i), Even numbered trees are guava trees. Odd numbered trees are mango trees. Trees numbered 4, 8 and 12 are not apple trees.

So, trees numbered 4, 8 and 12 are guava trees.

Step 2:

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Step 3:

From condition (iii), Since no three consecutive odd numbered trees are mango trees. Hence, tree 5 will be an apple tree and its fruiting age will be 7 years. So trees 7 and 11 would be mango trees.

Also, from condition (iii), The fruiting age of tree 11 will be 6 i.e., even number.

All the information can be shown in the following table.

Tree No.	1	2	3	4	5	6	7	8	9	10	11	12
Guava	×	×	×	✓	×	✓	×	✓	×	✓	×	✓
Mango	✓	×	✓	×	×	×	✓	×	×	×	✓	×
Apple	×	✓	×	×	✓	×	×	×	✓	×	×	×
Fruiting Age (in years)	5	8	5	2 or 4	7	3 or 4	5	4 or 3	8	2	6	4 or 2

The maximum difference between the fruiting ages of tree 3 and tree 12 is $5 - 2 = 3$ years.

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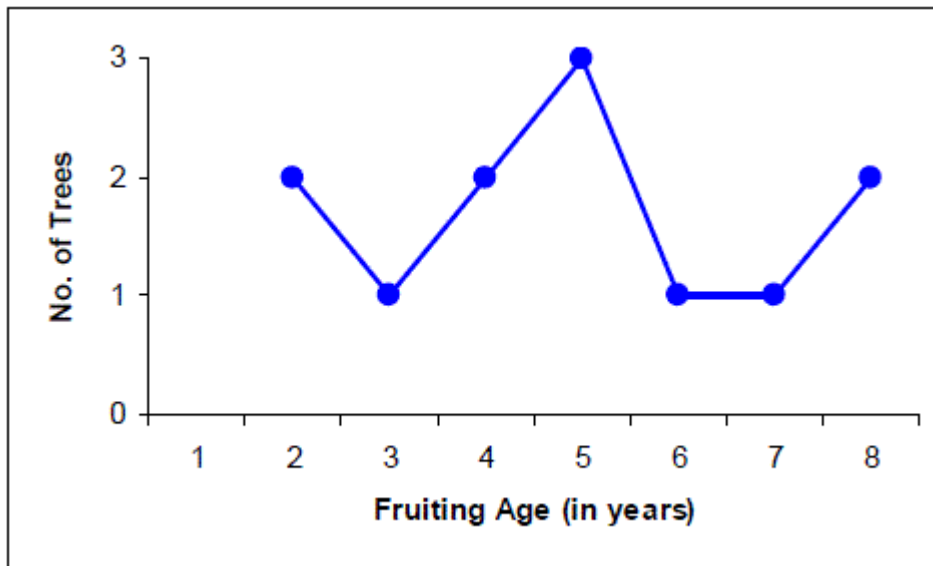
FeedBack

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- (iii) No three consecutive odd numbered trees are mango trees. The fruiting age of tree 11 is an even number.



Q.17 [11831809]

What is the sum total of the fruiting ages (in years) of odd numbered trees?

Solution:

Correct Answer : 36

[Answer key/Solution](#)

Step 1:

From the line graph, 5 are guava trees, 4 are mango trees and 3 are apple trees. The given information can be shown in the following table.

Fruiting age (in years)	2	3	4	5	6	7	8
No. of Trees	2	1	2	3	1	1	2
	Guava			Mango		Apple	

From condition (i), Even numbered trees are guava trees. Odd numbered trees are mango trees. Trees numbered 4, 8 and 12 are not apple trees.

So, trees numbered 4, 8 and 12 are guava trees.

Step 2:

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Step 3:

From condition (iii), Since no three consecutive odd numbered trees are mango trees. Hence, tree 5 will be an apple tree and its fruiting age will be 7 years. So trees 7 and 11 would be mango trees.

Also, from condition (iii), The fruiting age of tree 11 will be 6 i.e., even number.

All the information can be shown in the following table.

Tree No.	1	2	3	4	5	6	7	8	9	10	11	12
Guava	×	×	×	✓	×	✓	×	✓	×	✓	×	✓
Mango	✓	×	✓	×	×	×	✓	×	×	×	✓	×
Apple	×	✓	×	×	✓	×	×	×	✓	×	×	×
Fruiting Age (in years)	5	8	5	2 or 4	7	3 or 4	5	4 or 3	8	2	6	4 or 2

The sum total of the fruiting ages of odd numbered trees = $5 + 5 + 7 + 5 + 8 + 6 = 36$ years.

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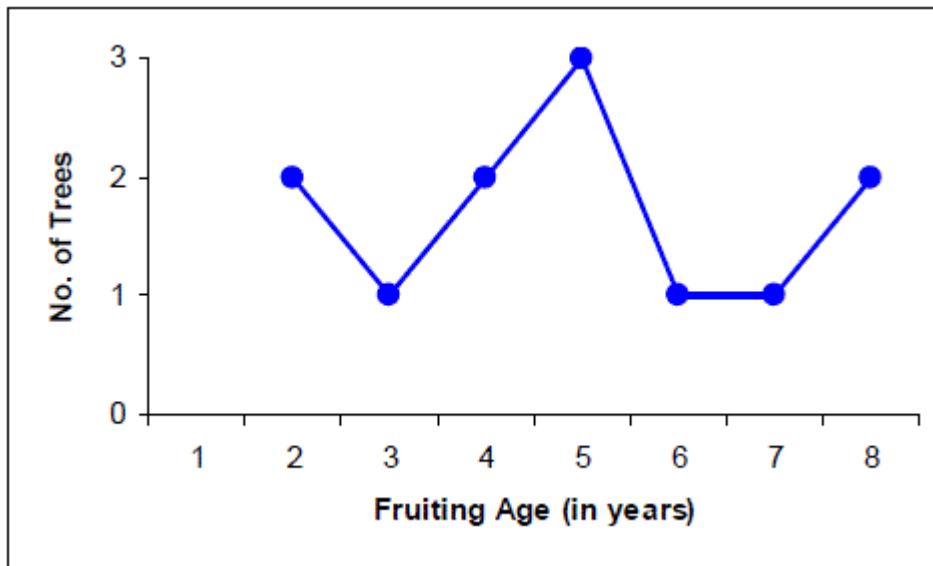
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Further, the following are known.

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- (ii) The fruiting age of all the trees, numbered 5 to 11, is different, with tree 9 requiring a maximum fruiting age and tree 10 requiring a minimum fruiting age.
- (iii) No three consecutive odd numbered trees are mango trees. The fruiting age of tree 11 is an even number.



Q.18 [11831809]

Which of the following statements MUST be CORRECT?

- 1 ☐ Tree 2 is a mango tree.
- 2 ☐ Tree 7 is an apple tree.
- 3 ☐ The fruiting age of tree 1 is 5 years.
- 4 ☐ The fruiting age of tree 4 is 4 years.

Solution:

Correct Answer : 3

[Answer key/Solution](#)

Step 1:

From the line graph, 5 are guava trees, 4 are mango trees and 3 are apple trees. The given information can be shown in the following table.

Fruiting age (in years)	2	3	4	5	6	7	8
No. of Trees	2	1	2	3	1	1	2
	Guava			Mango		Apple	

From condition (i), Even numbered trees are guava trees. Odd numbered trees are mango trees. Trees numbered 4, 8 and 12 are not apple trees.

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Also, from condition (iii), The fruiting age of tree 11 will be 6 i.e., even number.

All the information can be shown in the following table.

Tree No.	1	2	3	4	5	6	7	8	9	10	11	12
Guava	×	×	×	✓	×	✓	×	✓	×	✓	×	✓
Mango	✓	×	✓	×	×	×	✓	×	×	×	✓	×
Apple	×	✓	×	×	✓	×	×	×	✓	×	×	×
Fruiting Age (in years)	5	8	5	2 or 4	7	3 or 4	5	4 or 3	8	2	6	4 or 2

The statement given in option (3) MUST be CORRECT.

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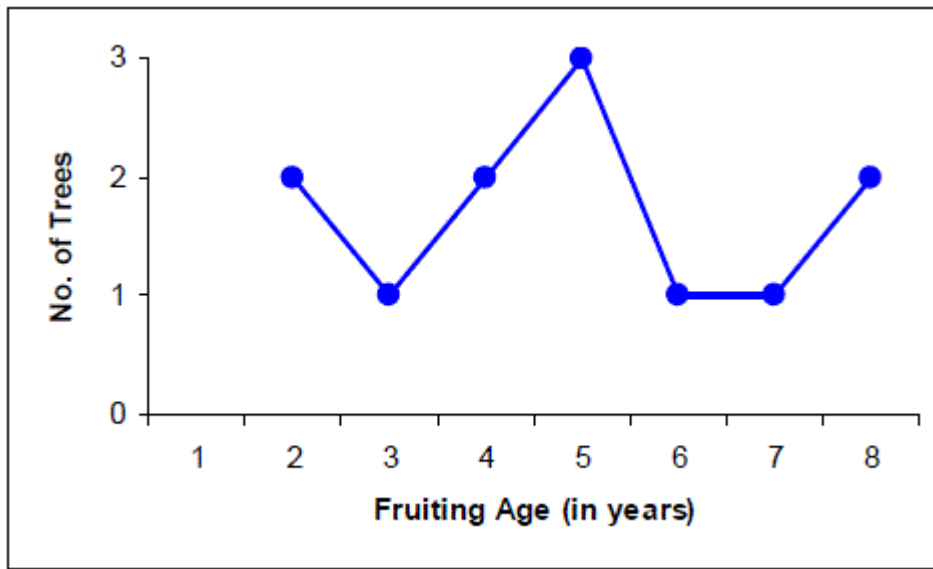
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Further, the following are known.

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- (iii) No three consecutive odd numbered trees are mango trees. The fruiting age of tree 11 is an even number.



Q.19 [11831809]

Which of the following statements MUST be FALSE?

- I. Tree 8 is a guava tree and its fruiting age is 3 years.
- II. Tree 7 is a mango tree and its fruiting age is 6 years.
- III. The fruiting age of tree 6 is 4 years.

1 ☐ I only

2 ☐ II only

3 ☐ III only

4 ☐ Both II & III

Solution:

Correct Answer : 2

[Answer key/Solution](#)

Step 1:

From the line graph, 5 are guava trees, 4 are mango trees and 3 are apple trees. The given information can be shown in the following table.

Fruiting age (in years)	2	3	4	5	6	7	8
No. of Trees	2	1	2	3	1	1	2
	Guava			Mango		Apple	

From condition (i), Even numbered trees are guava trees. Odd numbered trees are mango trees. Trees numbered 4, 8 and 12 are not apple trees.

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Since the fruiting age of three trees is 5 years. Hence, trees 1 and 3 will be mango trees and their fruiting age will be 5 years.

Step 3:

From condition (iii), Since no three consecutive odd numbered trees are mango trees. Hence, tree 5 will be an apple tree and its fruiting age will be 7 years. So trees 7 and 11 would be mango trees.

Also, from condition (iii), The fruiting age of tree 11 will be 6 i.e., even number.

All the information can be shown in the following table.

Tree No.	1	2	3	4	5	6	7	8	9	10	11	12
Guava	×	×	×	✓	×	✓	×	✓	×	✓	×	✓
Mango	✓	×	✓	×	×	×	✓	×	×	×	✓	×
Apple	×	✓	×	×	✓	×	×	×	✓	×	×	×
Fruiting Age (in years)	5	8	5	2 or 4	7	3 or 4	5	4 or 3	8	2	6	4 or 2

Only statement II MUST be FALSE.

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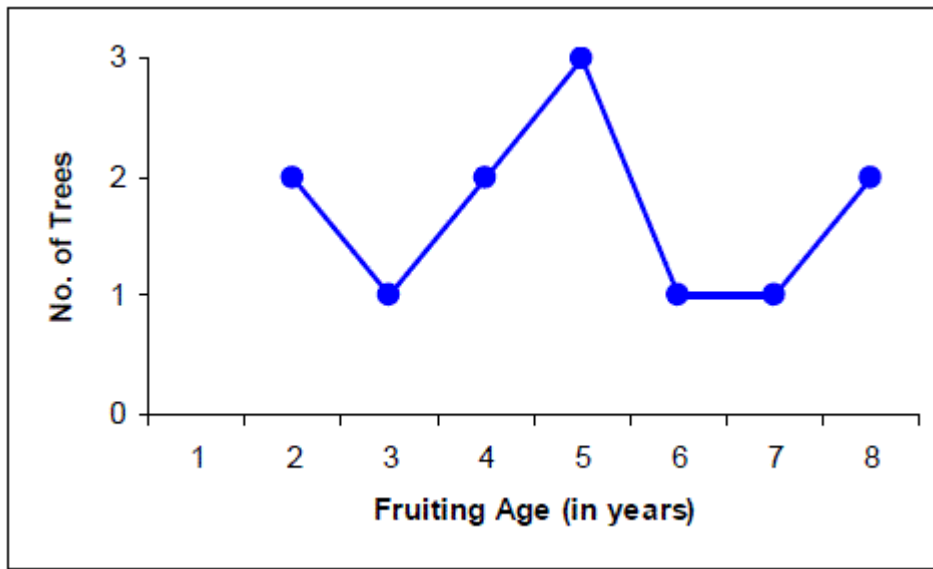
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Directions for questions 15 to 20: Answer the questions on the basis of the information given below.

Hariram, a farmer planted 12 trees, numbered 1 to 12, in his field. After taking good care of them, Hariram noticed that within a few years they started bearing fruits. The line graph given below shows the fruiting age (in years) of 12 trees. For any tree, the fruiting age (in years) is an integer. The fruiting age is 2 or 3 or 4 years for a guava tree, 5 or 6 years for a mango tree and 7 or 8 years for an apple tree.

Further, the following are known.

- (i) Odd-numbered trees are not guava trees; Even-numbered trees are not mango trees and trees, whose numbers are divisible by 4 are not apple trees.
- (ii) The fruiting age of all the trees, numbered 5 to 11, is different, with tree 9 requiring a maximum fruiting age and tree 10 requiring a minimum fruiting age.
- (iii) No three consecutive odd numbered trees are mango trees. The fruiting age of tree 11 is an even number.



Q.20 [11831809]

The sum of fruiting ages of 4 out of 12 trees is 28 years. If exactly one tree from tree 8 to tree 12 belongs to this group, then which of the following trees must be in this group?

1 ☐ Tree 9

2 ☐ Tree 11

3 ☐ Tree 4

4 ☐ Tree 6

Solution:

Correct Answer : 1

[Answer key/Solution](#)

Step 1:

From the line graph, 5 are guava trees, 4 are mango trees and 3 are apple trees. The given information can be shown in the following table.

Fruiting age (in years)	2	3	4	5	6	7	8
No. of Trees	2	1	2	3	1	1	2
	Guava			Mango		Apple	

From condition (i), Even numbered trees are guava trees. Odd numbered trees are mango trees. Trees numbered 4, 8 and 12 are not apple trees.

So, trees numbered 4, 8 and 12 are guava trees.

Step 2:

From condition (ii), The fruiting age of all the trees, numbered 5 to 11, is different i.e., 2, 3, 4, 5, 6, 7, 8 years. The fruiting age of tree 9 is 8 years and that of tree 10 is 2 years.

So tree 9 is an apple tree and tree 10 is a guava tree. Tree 6 will be a guava tree and tree 2 will be an apple tree. The fruiting age of tree 2 will be 8 years.

Since the fruiting age of three trees is 5 years. Hence, trees 1 and 3 will be mango trees and their fruiting age will be 5 years.

Step 3:

From condition (iii), Since no three consecutive odd numbered trees are mango trees. Hence, tree 5 will be an apple tree and its fruiting age will be 7 years. So trees 7 and 11 would be mango trees.

Also, from condition (iii), The fruiting age of tree 11 will be 6 i.e., even number.

All the information can be shown in the following table.

Tree No.	1	2	3	4	5	6	7	8	9	10	11	12
Guava	×	×	×	✓	×	✓	×	✓	×	✓	×	✓
Mango	✓	×	✓	×	×	×	✓	×	×	×	✓	×
Apple	×	✓	×	×	✓	×	×	×	✓	×	×	×
Fruiting Age (in years)	5	8	5	2 or 4	7	3 or 4	5	4 or 3	8	2	6	4 or 2

The sum of the fruiting ages of 9, 2, 5, and 1 or 3 or 7 trees is 28 years.

Hence, out of the given options, tree 9 must be in this group.

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