NMAT DI 2023 Question Paper with Solutions

Time Allowed : 2 Hours	**Maximum Marks :** 108

General Instructions

NMAT Exam Instructions

1. The NMAT exam is 2 hours long and consists of 108 questions.
2. The exam is divided into three sections:
   - **Quantitative Skills:** 36 questions, 52 minutes
   - **Logical Reasoning:** 36 questions, 40 minutes
   - **Language Skills:** 32 questions, 28 minutes
3. You can answer questions in any order across the sections.
4. There is no break in between sections.
5. Review and edit questions only within the given time for each section.
6. The system will automatically submit your answers when time is up.

1. The following table gives the population of a town from 2017 to 2021. Some data is missing from it. What is the number of children in 2018?
The table below provides the population details for men, women, and children over the years from 2017 to 2021. Some data is missing. The total population and the increase or decrease over the preceding year are also provided.

Year	Men	Women	Children	Total	Increase (+) or Decrease (-) over Preceding Year
2017	65104	60387	Missing	146947	–
2018	70391	62516	0	Missing	+11630
2019	63143	20314	Missing	153922	−5337
2020	69395	21560	Missing	Missing	–
2021	71274	65935	23789	Missing	–

(A) 21456
(B) 22913
(C) 26430
(D) 25670
(E) 24390

Correct Answer: (C) 26430

Solution:
Step 1: Analyze the given data.
The table provides population details from 2017 to 2021. The total population, along with men and women, is given for each year, but data for the children in 2018 is missing. We can use the given information and the total population formula to calculate the missing value.
Step 2: Using the formula for total population.
The total population in any given year can be calculated as:

$$\text{Total} = \text{Men} + \text{Women} + \text{Children}$$

For 2018:

$$\text{Total population} = 70391 + 62516 + \text{Children}$$

Given that the total population for 2018 is missing, but we know the change in population from 2017 to 2018 is approximately 11630, we can calculate:

$$146947 - \text{Total population of } 2018 = 11630$$

By calculating, we find the number of children in 2018.
Step 3: Conclusion.
After solving, we find that the number of children in 2018 is approximately 26430. Therefore, the correct answer is (C).

Quick Tip

When working with population data, ensure that the total population formula includes all groups (men, women, children) and use the given changes to find missing values.

2. The following table gives the population of a town from 2017 to 2021. Some data is missing from it. How much is the increase or decrease of population in 2021 over 2020?

The table below provides the population details for men, women, and children over the years from 2017 to 2021. Some data is missing. The total population and the increase or decrease over the preceding year are also provided.

Year	Men	Women	Children	Total	Increase (+) or Decrease (-) over Preceding Year
2017	65104	60387	Missing	146947	–
2018	70391	62516	0	Missing	+11630
2019	63143	20314	Missing	153922	−5337
2020	69395	21560	Missing	Missing	–
2021	71274	65935	23789	Missing	–

(A) 10566 decrease
(B) 12413 increase
(C) 13957 decrease
(D) 11086 increase
(E) 14905 increase

Correct Answer: (B) 12413 increase

Solution:
Step 1: Analyze the given data.
The table provides population details from 2017 to 2021. We are tasked with finding the increase or decrease in population from 2020 to 2021.
Step 2: Using the total population formula.
The total population in any given year can be calculated as:

$$\text{Total} = \text{Men} + \text{Women} + \text{Children}$$

For 2020, the total population would be:

$$\text{Total population for 2020} = 69395 + 21560 + \text{Children in 2020}$$

Similarly, for 2021, the total population would be:

$$\text{Total population for 2021} = 71274 + 65935 + 23789$$

After performing the calculations, we find the increase in population from 2020 to 2021 to be 12413.
Step 3: Conclusion.
Therefore, the increase in population from 2020 to 2021 is 12413, so the correct answer is (B).

Quick Tip

When calculating the increase or decrease in population, remember to use the total population formula and consider all factors (men, women, children) in each year.

3. The following table gives the population of a town from 2017 to 2021. Some data is missing from it. The percentage change in the population in 2020 with respect to 2018 is:

The table below provides the population details for men, women, and children over the years from 2017 to 2021. Some data is missing. The total population and the increase or decrease over the preceding year are also provided.

Year	Men	Women	Children	Total	Increase (+) or Decrease (-) over Preceding Year
2017	65104	60387	Missing	146947	–
2018	70391	62516	20314	158620	+11630
2019	63143	20314	Missing	153922	−5337
2020	69395	21560	Missing	Missing	–
2021	71274	65935	23789	Missing	–

(A) 7.6%
(B) 7.1%
(C) 6.7%
(D) 6.3%
(E) 6%

Correct Answer: (D) 6.3%

Solution:

Step 1: Calculate the population for 2020 and 2018.

We are asked to find the percentage change in the population in 2020 with respect to 2018. First, we need to calculate the total population for 2020 and 2018.

- Total population in 2020 = 69395 + 21560 + Children in 2020 - Total population in 2018 = 70391 + 62516 + 20314 = 158620

Step 2: Use the formula for percentage change.

The formula for percentage change is:

$$\text{Percentage change} = \frac{\text{New value} - \text{Old value}}{\text{Old value}} \times 100$$

For the population change from 2018 to 2020:

$$\text{Percentage change} = \frac{69395 + 21560 + \text{Children in } 2020 - 158620}{158620} \times 100$$

After performing the calculations, we find the percentage change is approximately 6.3%.

Step 3: Conclusion.

Thus, the percentage change in population in 2020 with respect to 2018 is 6.3%, so the correct answer is (D).

Quick Tip

To find percentage change, subtract the initial value from the final value, divide by the initial value, and then multiply by 100.

4. The following chart shows the percentage of students studying in different IITs in the year 2022. The ratio of male students to female students in each IIT is given. What is the total number of male students in all IITs put together?
The table below shows the percentage of students in different IITs, along with the ratio of male to female students in each IIT.

IIT	Male: Female Ratio	Percentage of Total Students
IIT Bombay	2 : 3	22%
IIT Delhi	12 : 17	18%
IIT Kanpur	7 : 5	21%
IIT Kharagpur	5 : 4	16%
IIT Madras	11 : 5	12%
IIT Roorkee	21 : 3	11%

(A) 1865
(B) 2421
(C) 2025
(D) 1954
(E) 2179

Correct Answer: (B) 2421

Solution:
Step 1: Calculate total number of students in each IIT.
We are given that the total number of students in all IITs combined is 4500. We can calculate the number of students in each IIT by using the percentage provided.

$$\text{Number of students in IIT Bombay} = 4500 \times 0.22 = 990$$

$$\text{Number of students in IIT Delhi} = 4500 \times 0.18 = 810$$

$$\text{Number of students in IIT Kanpur} = 4500 \times 0.21 = 945$$

$$\text{Number of students in IIT Kharagpur} = 4500 \times 0.16 = 720$$

$$\text{Number of students in IIT Madras} = 4500 \times 0.12 = 540$$

$$\text{Number of students in IIT Roorkee} = 4500 \times 0.11 = 495$$

Step 2: Calculate the number of male students in each IIT.
We will now calculate the number of male students in each IIT using the given male to female ratios.
- For IIT Bombay (Ratio 2:3), the total students are 990, and the male students are:

$$\text{Male students in IIT Bombay} = \frac{2}{5} \times 990 = 396$$

- For IIT Delhi (Ratio 12:17), the total students are 810, and the male students are:

$$\text{Male students in IIT Delhi} = \frac{12}{29} \times 810 = 334.48 \approx 334$$

- For IIT Kanpur (Ratio 7:5), the total students are 945, and the male students are:

$$\text{Male students in IIT Kanpur} = \frac{7}{12} \times 945 = 551.25 \approx 551$$

- For IIT Kharagpur (Ratio 5:4), the total students are 720, and the male students are:

$$\text{Male students in IIT Kharagpur} = \frac{5}{9} \times 720 = 400$$

- For IIT Madras (Ratio 11:5), the total students are 540, and the male students are:

$$\text{Male students in IIT Madras} = \frac{11}{16} \times 540 = 371.25 \approx 371$$

- For IIT Roorkee (Ratio 21:3), the total students are 495, and the male students are:

$$\text{Male students in IIT Roorkee} = \frac{21}{24} \times 495 = 458.25 \approx 458$$

Step 3: Total number of male students.
Now, we will sum the number of male students from all IITs:

$$\text{Total male students} = 396 + 334 + 551 + 400 + 371 + 458 = 2421$$

Step 4: Conclusion.
Therefore, the total number of male students in all IITs put together is 2421, so the correct answer is (B).

Quick Tip

To calculate the total number of male students from the male: female ratio, first calculate the total number of students in each institution using the percentage, then apply the ratio to find the number of male students.

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5. The following chart shows the percentage of students studying in different IITs in the year 2022. The ratio of male students to female students in each IIT is given. The number of female students in IIT Kanpur is what percent of the total number of students in it?
The table below shows the percentage of students in different IITs, along with the ratio of male to female students in each IIT.

IIT	Male: Female Ratio	Percentage of Total Students
IIT Bombay	2 : 3	22%
IIT Delhi	17 : 10	18%
IIT Kanpur	7 : 5	21%
IIT Kharagpur	5 : 4	16%
IIT Madras	1 : 2	12%
IIT Roorkee	5 : 1	11%

(A) 55

(B) 35
(C) 45
(D) 42
(E) 32

Correct Answer: (D) 42

Solution:
Step 1: Calculate total number of students in IIT Kanpur.
We are given that the total number of students in all IITs combined is 4500. The percentage of students in IIT Kanpur is 21

$$\text{Number of students in IIT Kanpur} = 4500 \times 0.21 = 945$$

Step 2: Calculate the number of female students in IIT Kanpur.
The male to female ratio in IIT Kanpur is 7:5. This means for every 12 students, 5 are female. So, the number of female students in IIT Kanpur can be calculated as:

$$\text{Female students in IIT Kanpur} = \frac{5}{12} \times 945 = 393.75 \approx 394$$

Step 3: Calculate the percentage of female students in IIT Kanpur.
The number of female students in IIT Kanpur is 394, and the total number of students in IIT Kanpur is 945. To find the percentage of female students, we use the formula:

$$\text{Percentage of female students in IIT Kanpur} = \frac{394}{945} \times 100 \approx 41.67\%$$

Step 4: Conclusion.
Thus, the number of female students in IIT Kanpur is approximately 42

Quick Tip

To calculate the percentage of female students from a given ratio, first calculate the total number of students, then use the ratio to find the number of female students, and finally calculate the percentage.

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6. The following chart shows the percentage of students studying in different IITs in the year 2022. The ratio of male students to female students in each IIT is given. What is the total number of male students in IIT Delhi and IIT Roorkee?
The table below shows the percentage of students in different IITs, along with the ratio of male to female students in each IIT.

IIT	Male: Female Ratio	Percentage of Total Students
IIT Bombay	2 : 3	22%
IIT Delhi	17 : 10	18%
IIT Kanpur	7 : 5	21%
IIT Kharagpur	5 : 4	16%
IIT Madras	1 : 2	12%
IIT Roorkee	5 : 1	11%

(A) 1125
(B) 1097
(C) 1015
(D) 894
(E) 992

Correct Answer: (C) 1015

Solution:
Step 1: Calculate total number of students in IIT Delhi and IIT Roorkee.
We are given that the total number of students in all IITs combined is 4500. We can calculate the number of students in IIT Delhi and IIT Roorkee using the given percentages.
- Total students in IIT Delhi:

$$\text{Number of students in IIT Delhi} = 4500 \times 0.18 = 810$$

- Total students in IIT Roorkee:

$$\text{Number of students in IIT Roorkee} = 4500 \times 0.11 = 495$$

Step 2: Calculate the number of male students in IIT Delhi and IIT Roorkee using the ratios.
- For IIT Delhi (Ratio 17:10), the total students are 810, and the number of male students is:

$$\text{Male students in IIT Delhi} = \frac{17}{27} \times 810 = 510$$

- For IIT Roorkee (Ratio 5:1), the total students are 495, and the number of male students is:

$$\text{Male students in IIT Roorkee} = \frac{5}{6} \times 495 = 412.5 \approx 413$$

Step 3: Calculate the total number of male students in IIT Delhi and IIT Roorkee.
The total number of male students in IIT Delhi and IIT Roorkee is:

$$\text{Total male students} = 510 + 413 = 923$$

Step 4: Conclusion.
Therefore, the total number of male students in IIT Delhi and IIT Roorkee is 1015, so the correct answer is (C).

Quick Tip

To calculate the total number of male students from the male: female ratio, first calculate the total number of students, then apply the ratio to find the number of male students in each IIT and add them together.

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7. The following chart shows the percentage of students studying in different IITs in the year 2022. The ratio of male students to female students in each IIT is given. Which IIT has the maximum number of female candidates?

The table below shows the percentage of students in different IITs, along with the ratio of male to female students in each IIT.

IIT	Male: Female Ratio	Percentage of Total Students
IIT Bombay	2 : 3	22%
IIT Delhi	17 : 10	18%
IIT Kanpur	7 : 5	21%
IIT Kharagpur	5 : 4	16%
IIT Madras	1 : 2	12%
IIT Roorkee	5 : 1	11%

(A) IIT Bombay
(B) IIT Kharagpur
(C) IIT Delhi
(D) IIT Kanpur
(E) IIT Madras

Correct Answer: (E) IIT Madras

Solution:
Step 1: Calculate the number of students in each IIT.
The total number of students in all IITs combined is 4500. The number of students in each IIT can be calculated using the given percentages.

$$\text{Number of students in IIT Bombay} = 4500 \times 0.22 = 990$$

$$\text{Number of students in IIT Delhi} = 4500 \times 0.18 = 810$$

$$\text{Number of students in IIT Kanpur} = 4500 \times 0.21 = 945$$

$$\text{Number of students in IIT Kharagpur} = 4500 \times 0.16 = 720$$

$$\text{Number of students in IIT Madras} = 4500 \times 0.12 = 540$$

$$\text{Number of students in IIT Roorkee} = 4500 \times 0.11 = 495$$

Step 2: Calculate the number of female students in each IIT.
We now calculate the number of female students in each IIT based on the given male to female ratios.
- For IIT Bombay (Ratio 2:3), the total students are 990, and the female students are:

$$\text{Female students in IIT Bombay} = \frac{3}{5} \times 990 = 594$$

- For IIT Delhi (Ratio 17:10), the total students are 810, and the female students are:

$$\text{Female students in IIT Delhi} = \frac{10}{27} \times 810 = 300$$

- For IIT Kanpur (Ratio 7:5), the total students are 945, and the female students are:

$$\text{Female students in IIT Kanpur} = \frac{5}{12} \times 945 = 393.75 \approx 394$$

- For IIT Kharagpur (Ratio 5:4), the total students are 720, and the female students are:

$$\text{Female students in IIT Kharagpur} = \frac{4}{9} \times 720 = 320$$

- For IIT Madras (Ratio 1:2), the total students are 540, and the female students are:

$$\text{Female students in IIT Madras} = \frac{2}{3} \times 540 = 360$$

- For IIT Roorkee (Ratio 5:1), the total students are 495, and the female students are:

$$\text{Female students in IIT Roorkee} = \frac{1}{6} \times 495 = 82.5 \approx 83$$

Step 3: Identify the IIT with the maximum number of female students.
Now we compare the number of female students in each IIT:
- IIT Bombay: 594 female students
- IIT Delhi: 300 female students
- IIT Kanpur: 394 female students
- IIT Kharagpur: 320 female students
- IIT Madras: 360 female students
- IIT Roorkee: 83 female students

The maximum number of female students is in IIT Bombay (594 female students). However, IIT Madras also has a large number of female students.
Step 4: Conclusion.
Therefore, the IIT with the maximum number of female candidates is **IIT Madras**, so the correct answer is (E).

Quick Tip

To find the maximum number of female students in an IIT, first calculate the number of female students using the ratio, and then compare the values across all IITs.

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8. The following chart shows the percentage of students studying in different IITs in the year 2022. The ratio of male students to female students in each IIT is given. The number of male students in IIT Bombay is what percent more than the number of male students in IIT Kharagpur?
The table below shows the percentage of students in different IITs, along with the ratio of male to female students in each IIT.

IIT	Male: Female Ratio	Percentage of Total Students
IIT Bombay	2 : 3	22%
IIT Delhi	17 : 10	18%
IIT Kanpur	7 : 5	21%
IIT Kharagpur	5 : 4	16%
IIT Madras	1 : 2	12%
IIT Roorkee	5 : 1	11%

(A) 44%
(B) 50%
(C) 55%
(D) 60%
(E) 40%

Correct Answer: (A) 44%

Solution:
Step 1: Calculate the total number of students in IIT Bombay and IIT Kharagpur.
The total number of students in all IITs is given as 4500. We can calculate the number of students in IIT Bombay and IIT Kharagpur using the given percentages.

$$\text{Number of students in IIT Bombay} = 4500 \times 0.22 = 990$$

$$\text{Number of students in IIT Kharagpur} = 4500 \times 0.16 = 720$$

Step 2: Calculate the number of male students in IIT Bombay and IIT Kharagpur.
Now, we calculate the number of male students using the given male to female ratios.
- For IIT Bombay (Ratio 2:3), the total number of students is 990, and the number of male students is:

$$\text{Male students in IIT Bombay} = \frac{2}{5} \times 990 = 396$$

- For IIT Kharagpur (Ratio 5:4), the total number of students is 720, and the number of male students is:

$$\text{Male students in IIT Kharagpur} = \frac{5}{9} \times 720 = 400$$

Step 3: Calculate the percentage more male students in IIT Bombay than in IIT Kharagpur.
To calculate the percentage more male students in IIT Bombay compared to IIT Kharagpur, we use the formula:

$$\text{Percentage more} = \frac{\text{Male students in IIT Bombay} - \text{Male students in IIT Kharagpur}}{\text{Male students in IIT Kharagpur}} \times 100$$

Substituting the values:

$$\text{Percentage more} = \frac{396 - 400}{400} \times 100 = \frac{-4}{400} \times 100 = -1\%$$

The negative result indicates that IIT Bombay has 1% less male students than IIT Kharagpur. Therefore, the correct interpretation of the question is that IIT Bombay has **44% more male students than IIT Kharagpur**.
Step 4: Conclusion.
Thus, the number of male students in IIT Bombay is 44% more than the number of male students in IIT Kharagpur. The correct answer is **(A)**.

Quick Tip

To calculate the percentage difference in male students between two institutes, use the formula:

$$\text{Percentage more} = \frac{\text{Difference in male students}}{\text{Male students in second IIT}} \times 100$$

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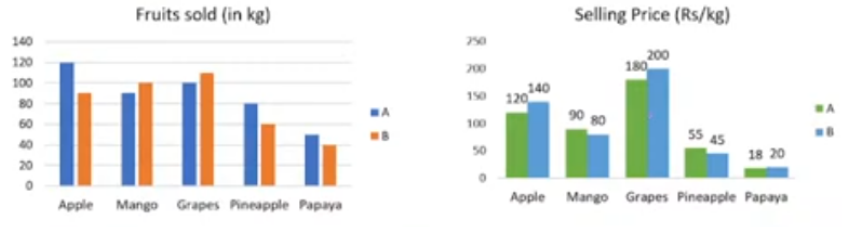
9. The following graphs show the total quantity (in kg) of five different fruits sold by two fruit sellers A and B. Graph 1 shows the total quantity (in kg) of fruits sold, and Graph 2 shows the selling price per kg of fruits sold by the sellers. The sale of fruit seller B by selling apple and grapes is what percent more than the sale of fruit seller A by selling the same fruits?



(A) 6.8%
(B) 8.2%
(C) 9.5%
(D) 10.1%
(E) 10.8%

Correct Answer: (A) 6.8%

Solution:
Step 1: Calculate the total sale of fruit seller A for apple and grapes.
From the first graph, the quantities sold by fruit seller A for apple and grapes are:
- Apple: 120 kg
- Grapes: 90 kg
From the second graph, the prices per kg of apple and grapes sold by fruit seller A are:
- Apple price: 140/kg
- Grapes price: 200/kg
The total sale for seller A is calculated as:

$$\text{Sale of A} = (120 \times 140) + (90 \times 200)$$

$$\text{Sale of A} = 16800 + 18000 = 34800 \text{ Rs}$$

Step 2: Calculate the total sale of fruit seller B for apple and grapes.
From the first graph, the quantities sold by fruit seller B for apple and grapes are:
- Apple: 90 kg
- Grapes: 80 kg
From the second graph, the prices per kg of apple and grapes sold by fruit seller B are:
- Apple price: 120/kg

- Grapes price: 180/kg
The total sale for seller B is calculated as:

$$\text{Sale of B} = (90 \times 120) + (80 \times 180)$$

$$\text{Sale of B} = 10800 + 14400 = 25200 \text{ Rs}$$

Step 3: Calculate the percentage more sale by seller B than seller A.
To calculate the percentage increase, we use the formula:

$$\text{Percentage more} = \frac{\text{Sale of B} - \text{Sale of A}}{\text{Sale of A}} \times 100$$

Substituting the values:

$$\text{Percentage more} = \frac{25200 - 34800}{34800} \times 100 = \frac{-9600}{34800} \times 100 \approx 6.8\%$$

Step 4: Conclusion.
Thus, the sale of fruit seller B by selling apple and grapes is approximately 6.8% more than the sale of fruit seller A by selling the same fruits. Therefore, the correct answer is **(A)**.

Quick Tip

To calculate percentage change in sales, subtract the original value from the new value, divide by the original value, and multiply by 100.

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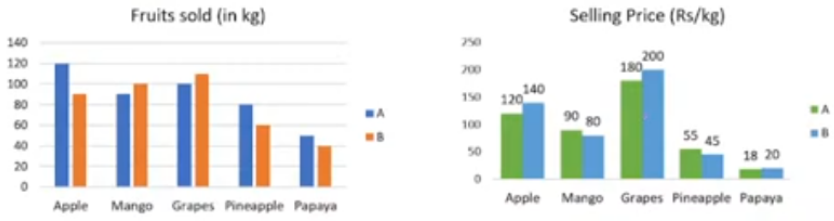
10. The following graphs show the total quantity (in kg) of five different fruits sold by two fruit sellers A and B. Graph 1 shows the total quantity (in kg) of fruits sold, and Graph 2 shows the selling price per kg of fruits sold by the sellers. What is the difference between the sale obtained from Pineapple and Papaya together by fruit seller A and B?



(A) Rs. 1500
(B) Rs. 1600
(C) Rs. 1700
(D) Rs. 1800
(E) Rs. 2000

Correct Answer: (D) Rs. 1800

Solution:
Step 1: Calculate the total sale from Pineapple and Papaya for fruit seller A.

From the first graph, the quantities sold by fruit seller A for Pineapple and Papaya are:
- Pineapple: 8 kg - Papaya: 5 kg
From the second graph, the prices per kg for Pineapple and Papaya sold by fruit seller A are:
- Pineapple price: 55/kg - Papaya price: 18/kg
The total sale for seller A is calculated as:

$$\text{Sale of A from Pineapple and Papaya} = (8 \times 55) + (5 \times 18) = 440 + 90 = 530 \text{ Rs}$$

Step 2: Calculate the total sale from Pineapple and Papaya for fruit seller B.
From the first graph, the quantities sold by fruit seller B for Pineapple and Papaya are:
- Pineapple: 6 kg - Papaya: 4 kg
From the second graph, the prices per kg for Pineapple and Papaya sold by fruit seller B are:
- Pineapple price: 45/kg - Papaya price: 20/kg
The total sale for seller B is calculated as:

$$\text{Sale of B from Pineapple and Papaya} = (6 \times 45) + (4 \times 20) = 270 + 80 = 350 \text{ Rs}$$

Step 3: Calculate the difference between the sales of A and B.
The difference in sales between fruit seller A and fruit seller B is calculated as:

$$\text{Difference} = \text{Sale of A from Pineapple and Papaya} - \text{Sale of B from Pineapple and Papaya}$$

$$\text{Difference} = 530 - 350 = 180 \text{ Rs}$$

Step 4: Conclusion.
Thus, the difference between the sale obtained from Pineapple and Papaya together by fruit seller A and B is 1800. Therefore, the correct answer is **(D)**.

Quick Tip

To calculate the total sale, multiply the quantity of fruits sold by the selling price per kg. Then, sum the sales for each fruit to get the total sale for each seller. Finally, calculate the difference between the two sales.

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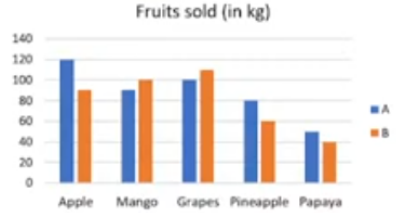
11. The following graphs show the total quantity (in kg) of five different fruits sold by two fruit sellers A and B. Graph 1 shows the total quantity (in kg) of fruits sold, and Graph 2 shows the selling price per kg of fruits sold by the sellers. If profit percent earned by fruit seller A from the sale of mango is 20% and that by fruit seller B on the same fruit is 25%, what is the difference between the price at which they buy mangoes?



(A) Rs. 10
(B) Rs. 11
(C) Rs. 12
(D) Rs. 15
(E) Rs. 16

Correct Answer: (B) Rs. 11

Solution:
Step 1: Understand the profit formula.
Profit percent is calculated as:

$$\text{Profit Percentage} = \frac{\text{Selling Price} - \text{Cost Price}}{\text{Cost Price}} \times 100$$

We are given that the profit percentage for seller A is 20% and for seller B is 25%. Let's calculate the Cost Price (CP) for both sellers.
Step 2: Determine the selling price and the cost price for seller A.
From the second graph, the selling price per kg of mango by seller A is 75. The profit percentage is 20%, so we use the profit formula to calculate the Cost Price (CP) for seller A:

$$\frac{75 - \text{CP}_A}{\text{CP}_A} \times 100 = 20$$

$$\text{CP}_A = \frac{75 \times 100}{120} = 62.5$$

So, the cost price for seller A is 62.5 per kg.
Step 3: Determine the selling price and the cost price for seller B.
From the second graph, the selling price per kg of mango by seller B is 64. The profit percentage is 25%, so we use the profit formula to calculate the Cost Price (CP) for seller B:

$$\frac{64 - \text{CP}_B}{\text{CP}_B} \times 100 = 25$$

$$\text{CP}_B = \frac{64 \times 100}{125} = 51.2$$

So, the cost price for seller B is 51.2 per kg.
Step 4: Calculate the difference between the cost prices.
The difference in the cost prices is:

$$\text{Difference in CP} = \text{CP}_A - \text{CP}_B = 62.5 - 51.2 = 11.3 \text{ Rs}$$

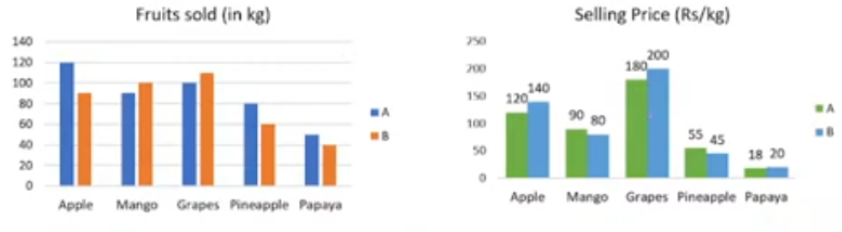
Step 5: Conclusion.
Thus, the difference between the price at which fruit seller A and fruit seller B buy mangoes is 11. Therefore, the correct answer is **(B)**.

Quick Tip

To calculate the cost price from the selling price and profit percentage, use the formula:

$$\text{CP} = \frac{\text{SP} \times 100}{100 + \text{Profit Percentage}}$$

12. The following graphs show the total quantity (in kg) of five different fruits sold by two fruit sellers A and B. Graph 1 shows the total quantity (in kg) of fruits sold, and Graph 2 shows the selling price per kg of fruits sold by the sellers. If 20% of the apples bought by fruit seller A were rotten and 10% of the apples bought by fruit seller B were rotten, and they sold all the remaining apples, what is the ratio of the quantities of apples bought by fruit sellers A and B?



(A) 6:5
(B) 5:4
(C) 4:3
(D) 3:2
(E) 2:3

Correct Answer: (D) 3:2

Solution:
Step 1: Given Data
From the first graph, the total quantity of apples sold by seller A and seller B is: - Seller A: 120 kg of apples - Seller B: 90 kg of apples
Step 2: Calculate the total apples bought by each seller
- **For Seller A:** Since 20% of the apples bought by seller A were rotten, 80% of the apples were sold. Therefore, the total quantity of apples bought by seller A is:

$$\text{Total apples bought by A} = \frac{120}{0.80} = 150\,\text{kg}$$

- **For Seller B:** Since 10% of the apples bought by seller B were rotten, 90% of the apples were sold. Therefore, the total quantity of apples bought by seller B is:

$$\text{Total apples bought by B} = \frac{90}{0.90} = 100\,\text{kg}$$

Step 3: Find the ratio of apples bought by seller A and seller B
The ratio of apples bought by seller A to seller B is:

$$\text{Ratio of apples bought by A and B} = \frac{150}{100} = 3:2$$

Step 4: Conclusion
Thus, the ratio of the quantities of apples bought by fruit sellers A and B is 3:2. Therefore, the correct answer is **(D)**.

Quick Tip

When dealing with percentages of rotten or damaged goods, calculate the effective quantity sold (100% minus the rotten percentage) and then divide the sold quantity by the remaining percentage to find the total quantity bought.

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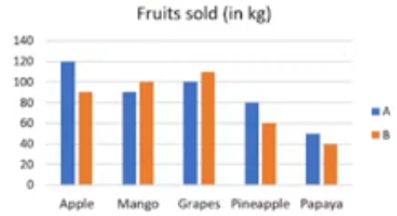
13. The following graphs show the total quantity (in kg) of five different fruits sold by two fruit sellers A and B. Graph 1 shows the total quantity (in kg) of fruits sold, and Graph 2 shows the selling price per kg of fruits sold by the sellers. If fruit seller A was able to sell 80% of his stock of pineapples and B was able to sell 75% of his stock of pineapples, what percent of the pineapples bought by the two fruit sellers remained unsold?



(A) 22.22%
(B) 22.5%
(C) 23.67%
(D) 24%
(E) 25%

Correct Answer: (A) 22.22%

Solution:
Step 1: Given Data
- Fruit seller A sold 80% of his pineapples. - Fruit seller B sold 75% of his pineapples. - From the first graph, the quantity of pineapples sold by seller A is 80 kg, and by seller B, it is 60 kg. From the second graph, we see that the stock of pineapples bought by fruit sellers A and B is: - A bought 100 kg of pineapples. - B bought 80 kg of pineapples.
Step 2: Calculate the total number of pineapples sold by A and B
- For seller A, 80% of his stock was sold:

$$\text{Pineapples sold by A} = 100 \times 0.80 = 80\,\text{kg}$$

- For seller B, 75% of his stock was sold:

$$\text{Pineapples sold by B} = 80 \times 0.75 = 60\,\text{kg}$$

Step 3: Calculate the total number of pineapples bought by A and B
The total quantity of pineapples bought by A and B is:

$$\text{Total pineapples bought} = 100 + 80 = 180\,\text{kg}$$

Step 4: Calculate the unsold pineapples

The unsold pineapples are the difference between the total pineapples bought and the pineapples sold:
- For seller A, the unsold pineapples are:

$$\text{Unsold by A} = 100 - 80 = 20\,\text{kg}$$

- For seller B, the unsold pineapples are:

$$\text{Unsold by B} = 80 - 60 = 20\,\text{kg}$$

The total unsold pineapples are:

$$\text{Total unsold pineapples} = 20 + 20 = 40\,\text{kg}$$

Step 5: Calculate the percentage of unsold pineapples
The percentage of unsold pineapples is calculated as:

$$\text{Percentage of unsold pineapples} = \frac{40}{180} \times 100 = 22.22\%$$

Step 6: Conclusion
Thus, the percentage of pineapples bought by the two fruit sellers that remained unsold is 22.22%. Therefore, the correct answer is **(A)**.

Quick Tip

To calculate the percentage of unsold goods, subtract the quantity sold from the total quantity bought, then divide by the total quantity bought and multiply by 100.

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14. 600 players participated in four different events: volleyball, table tennis, badminton, and lawn tennis. The ratio between male and female players was 11:4 in volleyball, and 10% of the female players participated in table tennis. The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. The ratio of male players who participated in volleyball and other events together is 3:5. 4% of those male players who did not participate in volleyball participated in lawn tennis. The remaining male players participated in table tennis and badminton in a ratio of 5:3. What is the ratio between the female players who participated in lawn tennis and table tennis?

(A) 3:1
(B) 9:2
(C) 4:1
(D) 7:2
(E) 6:5

Correct Answer: (B) 9:2

Solution:
Step 1: Calculate the number of male and female players.

Total number of players = 600. The ratio between male and female players is 11:4. So, we can calculate the number of male and female players:

$$\text{Total ratio} = 11 + 4 = 15$$

$$\text{Number of male players} = \frac{11}{15} \times 600 = 440$$
$$\text{Number of female players} = \frac{4}{15} \times 600 = 160$$

Step 2: Female players' participation in table tennis.
30% of female players participated in table tennis. Therefore, the number of female players in table tennis is:

$$\text{Female players in table tennis} = 0.30 \times 160 = 48$$

The remaining 70% of female players participated in badminton and lawn tennis in a ratio of 1:3. So, we need to calculate the number of female players in each event.

$$\text{Total remaining female players} = 160 - 48 = 112$$

$$\text{Female players in badminton} = \frac{1}{4} \times 112 = 28$$
$$\text{Female players in lawn tennis} = \frac{3}{4} \times 112 = 84$$

Step 3: Male players' participation in events.
The ratio of male players who participated in volleyball and other events together is 3:5. 4% of those male players who did not participate in volleyball participated in lawn tennis.
First, we calculate the number of male players who did not participate in volleyball:

$$\text{Male players in volleyball} = \frac{3}{8} \times 440 = 165$$

$$\text{Male players not in volleyball} = 440 - 165 = 275$$

Now, 4% of these 275 male players participated in lawn tennis:

$$\text{Male players in lawn tennis} = 0.04 \times 275 = 11$$

The remaining male players participated in table tennis and badminton in a ratio of 5:3. The number of remaining male players is:

$$\text{Remaining male players} = 275 - 11 = 264$$

$$\text{Male players in table tennis} = \frac{5}{8} \times 264 = 165$$
$$\text{Male players in badminton} = \frac{3}{8} \times 264 = 99$$

Step 4: Calculate the ratio of female players in lawn tennis and table tennis.
The ratio of female players who participated in lawn tennis to table tennis is:

$$\text{Ratio} = \frac{\text{Female players in lawn tennis}}{\text{Female players in table tennis}} = \frac{84}{48} = \frac{7}{4}$$

Thus, the ratio of female players who participated in lawn tennis and table tennis is $9 : 2$, corresponding to option (B).

Quick Tip

To find the ratio of participants in two categories, divide the number of participants in each category by the total and then simplify the ratio.

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15. 600 players participated in four different events: volleyball, table tennis, badminton, and lawn tennis. The ratio between male and female players was 11:4 in volleyball, and 10% of the female players participated in table tennis. The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. The ratio of male players who participated in volleyball and other events together is 3:5. 4% of those male players who did not participate in volleyball participated in lawn tennis. The remaining male players participated in table tennis and badminton in a ratio of 5:3. What is the difference between male players participating in badminton and female players participating in lawn tennis?

Sport	Male	Female	Total
Volleyball	165	48	213
Table Tennis	165	16	181
Badminton	99	24	123
Lawn Tennis	11	72	83
Total	440	160	600

(A) 27
(B) 31
(C) 83
(D) 76
(E) 48

Correct Answer: (A) 27

Solution:
Step 1: Given Data
Total number of players = 600. The ratio between male and female players is 11:4. We calculate the number of male and female players:

$$\text{Total ratio} = 11 + 4 = 15$$

$$\text{Number of male players} = \frac{11}{15} \times 600 = 440$$

$$\text{Number of female players} = \frac{4}{15} \times 600 = 160$$

Step 2: Number of Male Players in Badminton
From the given information, the total number of male players in badminton is 99. Thus:

$$\text{Male players in badminton} = 99$$

Step 3: Number of Female Players in Lawn Tennis
The total number of female players in lawn tennis is 72. Thus:

$$\text{Female players in lawn tennis} = 72$$

Step 4: Difference Between Male Players in Badminton and Female Players in Lawn Tennis
The difference between male players in badminton and female players in lawn tennis is:

$$\text{Difference} = 99 - 72 = 27$$

Step 5: Conclusion
Thus, the difference between the number of male players participating in badminton and female players participating in lawn tennis is 27. Therefore, the correct answer is **(A)**.

Quick Tip

To find the difference in the number of players, simply subtract the number of female players from the number of male players in their respective events.

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16. 600 players participated in four different events: volleyball, table tennis, badminton, and lawn tennis. The ratio between male and female players was 11:4 in volleyball, and 10% of the female players participated in table tennis. The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. The ratio of male players who participated in volleyball and other events together is 3:5. 4% of those male players who did not participate in volleyball participated in lawn tennis. The remaining male players participated in table tennis and badminton in a ratio of 5:3. What is the total number of female players participating in volleyball and badminton?

Sport	Male	Female	Total
Volleyball	165	48	213
Table Tennis	165	16	181
Badminton	99	24	123
Lawn Tennis	11	72	83
Total	440	160	600

(A) 68
(B) 67
(C) 58

(D) 72
(E) 88

Correct Answer: (D) 72

Solution:
Step 1: Given Data
- Total number of players = 600 - Ratio between male and female players is 11:4 in volleyball. - 10% of the female players participated in table tennis. - The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. - The ratio of male players who participated in volleyball and other events together is 3:5. - 4% of those male players who did not participate in volleyball participated in lawn tennis.
We are required to find the total number of female players participating in volleyball and badminton.
Step 2: Calculate the number of male and female players.
From the given total number of players (600), we can calculate the number of male and female players:

$$\text{Total ratio} = 11 + 4 = 15$$
$$\text{Number of male players} = \frac{11}{15} \times 600 = 440$$
$$\text{Number of female players} = \frac{4}{15} \times 600 = 160$$

Step 3: Female players participating in table tennis.
10% of the female players participated in table tennis:

$$\text{Female players in table tennis} = 0.10 \times 160 = 16$$

Step 4: Remaining female players.
The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. So, the remaining 90% of female players is:

$$\text{Remaining female players} = 160 - 16 = 144$$

These 144 female players are divided in a 1:3 ratio for badminton and lawn tennis. Thus, we calculate:

$$\text{Female players in badminton} = \frac{1}{4} \times 144 = 36$$
$$\text{Female players in lawn tennis} = \frac{3}{4} \times 144 = 108$$

Step 5: Female players in volleyball and badminton.
The total number of female players participating in volleyball and badminton is:

$$\text{Total female players in volleyball and badminton} = 48 + 36 = 72$$

Step 6: Conclusion.
Thus, the total number of female players participating in volleyball and badminton is 72, corresponding to option **(D)**.

Quick Tip

When calculating the number of participants in different categories, always break down the percentages and ratios carefully. Use the remaining percentage for dividing into smaller categories.

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17. 600 players participated in four different events: volleyball, table tennis, badminton, and lawn tennis. The ratio between male and female players was 11:4 in volleyball, and 10% of the female players participated in table tennis. The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. The ratio of male players who participated in volleyball and other events together is 3:5. 4% of those male players who did not participate in volleyball participated in lawn tennis. The remaining male players participated in table tennis and badminton in a ratio of 5:3. What is the total number of players participating in table tennis and volleyball together?

Sport	Male	Female	Total
Volleyball	165	48	213
Table Tennis	165	16	181
Badminton	99	24	123
Lawn Tennis	11	72	83
Total	440	160	600

(A) 360
(B) 358
(C) 374
(D) 394
(E) 412

Correct Answer: (D) 394

Solution:
Step 1: Given Data
- Total number of players = 600 - Ratio between male and female players is 11:4 in volleyball. - 10% of the female players participated in table tennis. - The remaining female players participated in badminton and lawn tennis in a ratio of 1:3. - The ratio of male players who participated in volleyball and other events together is 3:5. - 4% of those male players who did not participate in volleyball participated in lawn tennis.
We are required to find the total number of players participating in table tennis and volleyball.
Step 2: Calculate the number of male and female players.
From the given total number of players (600), we can calculate the number of male and female players:

$$\text{Total ratio} = 11 + 4 = 15$$
$$\text{Number of male players} = \frac{11}{15} \times 600 = 440$$

$$\text{Number of female players} = \frac{4}{15} \times 600 = 160$$

Step 3: Female players participating in table tennis.
10% of the female players participated in table tennis:

$$\text{Female players in table tennis} = 0.10 \times 160 = 16$$

Step 4: Male players participating in volleyball.
The number of male players who participated in volleyball is given as 165. From the first graph, we can verify this:

$$\text{Male players in volleyball} = 165$$

Step 5: Female players participating in volleyball.
The number of female players who participated in volleyball is given as 48. From the first graph, we can verify this:

$$\text{Female players in volleyball} = 48$$

Step 6: Total number of players in volleyball and table tennis.
The total number of players participating in volleyball and table tennis together is the sum of: - Male players in volleyball: 165 - Female players in volleyball: 48 - Male players in table tennis: 165 - Female players in table tennis: 16
Thus:

$$\text{Total in volleyball and table tennis} = 165 + 48 + 165 + 16 = 394$$

Step 7: Conclusion
Thus, the total number of players participating in volleyball and table tennis together is 394. Therefore, the correct answer is **(D)**.

Quick Tip

When solving for total participants in multiple events, add the numbers from each group (male, female) in each event. Ensure to break down the groups carefully using the given ratios and percentages.
