CAREERS360

PREPARATION Series

CUET PG MBA 2025

Data Interpretation

CONTENTS

A note to the
Students

The Data Interpretation section is essential for any management exam aspirant because these questions are frequently asked in various management entrance examinations. CUET PG MBA is also no exception. While analyzing the previous year's question papers, it can be inferred that Data Interpretation questions are frequently asked. With the right practice, this section can be aced. Keeping these factors in mind, we at Careers360, have designed an ebook specifically for acing the Data Interpretation section of the CUET PG MBA examination.

This ebook covers all the important types of DI questions that are asked in the CUET PG MBA examination. The type and levels of the questions are also designed to match the standard of the actual examination. Along with numerous solved exercises and practice questions, candidates are also presented with fully solved previous year's CUET PG MBA examination questions. With the ambudence of the questions, candidates can ace this section improving their overall in both the DFI section and scoring percentile.

We hope that you can find our resource useful and helpful in your CUET preparation journey. We wish you all the very best for your examination preparation and for your successful management career.

Warm regards
Team Careers360

ABOUT THE EBOOK

This eBook is your one-stop solution, composed with theory, solved examples, and practice exercises to ace the Data Interpretation section. Apart from the theory we have provided the following:

1. Solved examples and practice exercises on Pie Charts

2. Solved examples and practice exercises on Line Charts

3. Solved examples and practice exercises on Bar Graphs

4. Solved examples and practice exercises on Bar Graphs

5. Solved examples and practice exercises on Table-based Data Interpretation

6. Solved examples and practice exercises on Mixed Graphs

7. Solved examples and practice exercises on Data Sufficiency

8. Solved examples and practice exercises on Sets and Venn Diagrams

PIE CHARTS

A pie chart is a circular graphical representation used to display data as a "pie" divided into slices. Each slice represents a category or a portion of the whole, and the size of each slice is proportional to the quantity it represents. Pie charts are especially useful for illustrating the distribution of data in a clear and visually appealing manner.

Key Components of Pie Charts:

● Circle: The entire pie chart is shaped like a circle, which represents the whole or the total.
● Slices: Slices, or sectors, are individual portions of the pie that represent categories or data values. The size of each slice is proportional to the data it represents.
● Categories: Categories are the items or groups being compared in the pie chart. Each category is typically labelled within or near its corresponding slice.

Interpreting Pie Charts:

● Pie charts are used to show the distribution of data as parts of a whole.
● They are effective for comparing the relative sizes of categories within a dataset.

Example Pie Chart:

Let's consider an example pie chart to illustrate these concepts:

Percentage of Total Budget
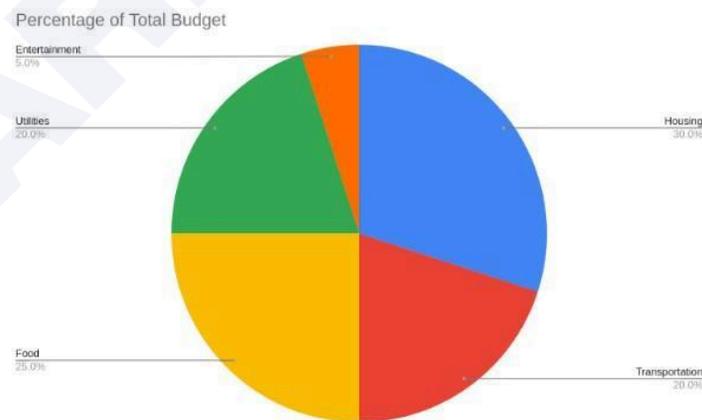
Interpreting the Example Pie Chart:

● This pie chart represents the distribution of expenses in a household budget.
● Each slice of the pie represents a category of expenses, such as "Housing," "Transportation," "Food," "Utilities," and "Entertainment."

- The size of each slice (angle) corresponds to the percentage of the total budget spent on that category.

Sample Questions:

- What percentage of the total budget is spent on "Housing" expenses?

    Answer: Housing expenses represent 30% of the total budget.

- Which expense category consumes the least amount of the budget?

   Answer: "Entertainment" expenses consume the least amount of the budget.

- If the total budget is $5,000, how much is spent on "Utilities"?

    Answer: $1,000 is spent on "Utilities."

Conclusion: Pie charts are valuable tools for illustrating the distribution of data within a whole. They allow for easy visual comparisons of categories and their relative sizes. Understanding how to interpret and analyze pie charts is essential for gaining insights into the composition of data and making informed decisions based on proportions and percentages. Regular practice with pie chart-based questions enhances your ability to extract meaningful information from data representations accurately

SOLVED EXAMPLES

1. The pie chart given below shows the number of cars sold by 8 different companies. The total number of cars sold by all these 8 companies is 2,000. The number of cars sold by a particular company is shown as a per cent of the total number of cars sold by all these 8 companies.
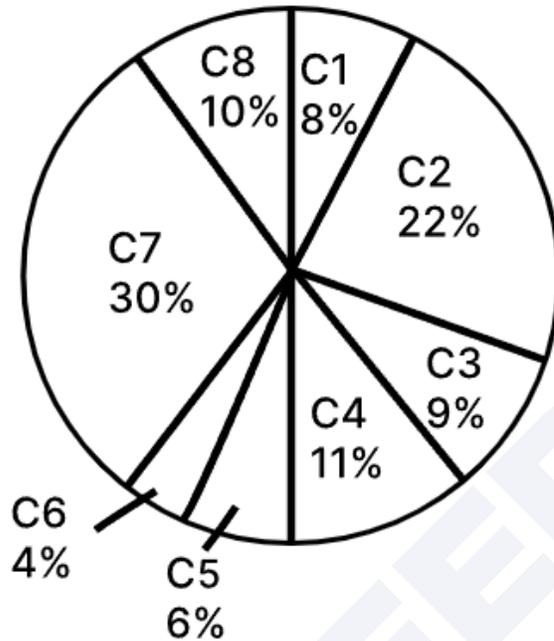
The average number of cars sold by C1 and C2 is how much per cent less than the average number of cars sold by C7 and C8?

    A. 66.66%
    B. 33.33%
    C. 16.66%
    D. 25%

SOLUTION

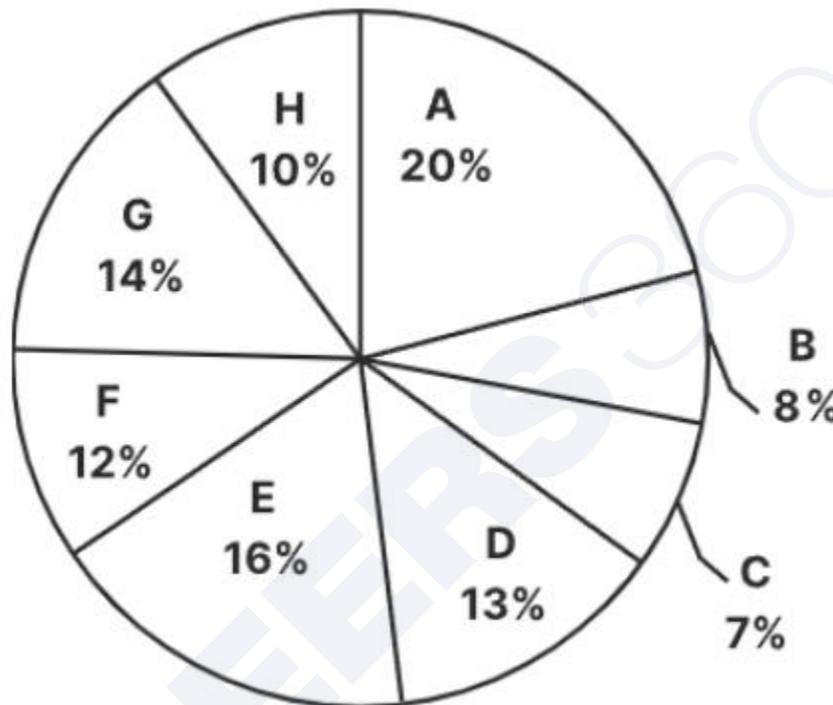The average number of cars sold by C1 and C2 = (8 + 22) / 2 = 15%.

The average number of cars sold by C7 and C8 = (10 + 30) / 2 = 20%.

The average number of cars sold by C1 and C2 is less than the average number of cars sold by C7 and C8 = 20% – 15% = 5%.

The required percentage = (5/20) × 100 = 25%.

Hence, the correct answer is 25%.

2. The pie chart given below shows the number of cars sold by 8 different companies. The total number of cars sold by all these 8 companies is 10,000. The number of cars sold by a particular company is shown as a percentage of the total number of cars sold by all these 8 companies.

Which of the following statements is correct?
I. The average number of cars sold by companies B, F, and H is 100.
II. The ratio of the number of cars sold by A to the number of cars sold by E is 4 : 5.

    A. Only I
    B. Only II
    C. Neither I nor II
    D. Both I and II

SOLUTION

Given, Total = 10000

Statement I: The average number of cars sold by companies B, F and H are 100.
Number of cars sold by B = 8% of 10,000 = 800
Number of cars sold by F = 12% of 10,000 = 1200
Number of cars sold by H = 10% of 10,000 = 1000
Average = (800 + 1200 + 1000) / 3 = 3000 / 3 = 1000
⇒ Statement I is incorrect

Statement II. The ratio of the number of cars sold by A to the number of cars sold by E is 4 : 5.
Number of cars sold by A = 20% of 10,000 = 2000
Number of cars sold by E = 16% of 10,000 = 1600
Ratio = 2000 : 1600 = 5 : 4
⇒ Statement II is incorrect.

Hence, the correct answer is Neither I nor II.

3. The pie chart given below shows the number of cars sold by 8 different companies. The total number of cars sold by all these 8 companies is 1000. The number of cars sold by a particular company is shown as a percent of the total number of cars sold by all these 8 companies.
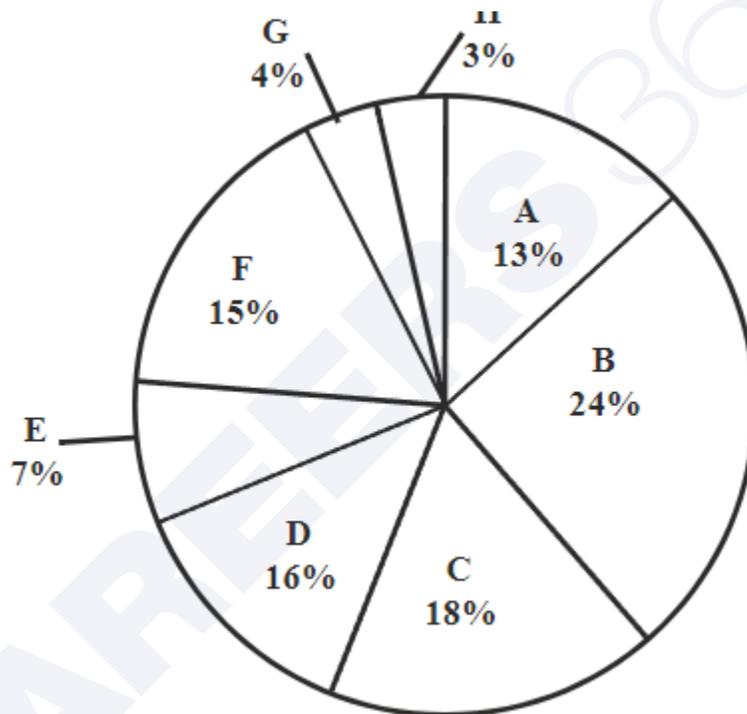
What is the difference between the central angle formed by sectors A, B, and C together and the central angle formed by sectors E, F, and G together?

    A. 72.8°
    B. 88.4°
    C. 104.4
    D. 102.6°

SOLUTION

Sectors A, B, and C altogether comprise 55% (13 + 24 + 18) of the central angle.

Sectors E, F, and G altogether comprise 26% (7 + 15 + 19) of the central angle.

Required difference = (55 – 26)% of the central angle = 29% of the central angle

= (29 / 100) × 360°

= 104.4°

Hence, the correct answer is 104.4°.

4. The pie chart given below shows the number of cars sold by 8 different companies. The total number of cars sold by all these 8 companies is 5,000. The number of cars sold by a particular company is shown as a percentage of the total number of cars sold by all these 8 companies.
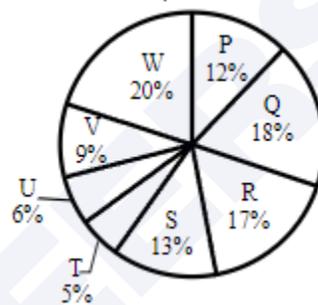
What is the ratio of the total central angle formed by sectors R and S to the total central angle formed by sectors U and V?

    A. 1 : 4
    B. 2 : 1
    C. 1 : 2
    D. 3 : 1

SOLUTION

SOLUTION

Total number of cars sold = 5000

Sector R and S = 17% of 5000 + 13% of 5000

= 850 + 650 = 1500

Sectors U and V = 6% of 5000 + 9% of 5000

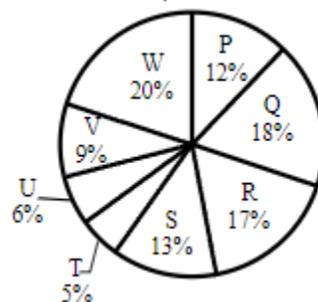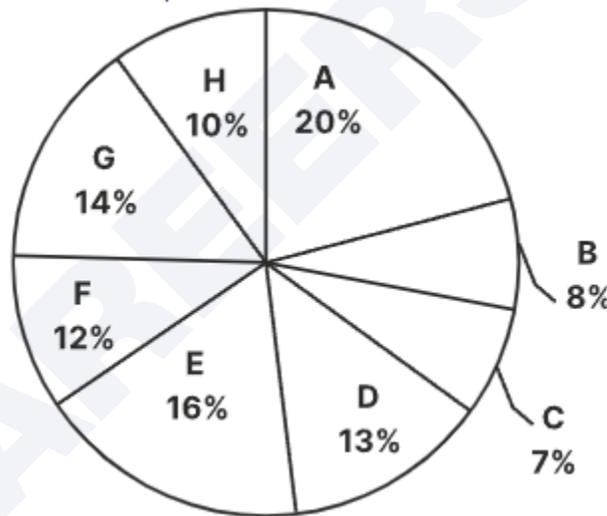= 300 + 450 = 750

So, the required ratio = 1500 : 750 = 2 : 1

Hence, the correct answer is 2 : 1.

5. The pie chart given below shows the number of cars sold by 8 different companies. The total number of cars sold by all these 8 companies is 10,000. The number of cars sold by a particular company is shown as a percentage of the total number of cars sold by all these 8 companies.

Which of the following statements is correct?

I. The average number of cars sold by companies B, F, and H is 100.

II. The ratio of the number of cars sold by A to the number of cars sold by E is 4 : 5.

    A. Only I
    B. Only II
    C. Neither I nor II
    D. Both I and II

SOLUTION

Given, Total = 10000

Statement I: The average number of cars sold by companies B, F, and H are 100.

Number of cars sold by B = 8% of 10,000 = 800

Number of cars sold by F = 12% of 10,000 = 1200

Number of cars sold by H = 10% of 10,000 = 1000

Average = (800 + 1200 + 1000) / 3 = 3000 / 3 = 1000

$\Rightarrow$ Statement I is incorrect

Statement II. The ratio of the number of cars sold by A to the number of cars sold by E is 4 : 5.

Number of cars sold by A = 20% of 10,000 = 2000

Number of cars sold by E = 16% of 10,000 = 1600

Ratio = 2000 : 1600 = 5 : 4

$\Rightarrow$ Statement II is incorrect.

Hence, the correct answer is Neither I nor II.

6. Study the given pie chart and answer the question that follows.

The following pie chart shows the sectors representing the shares of the number of chairs produced in a given year of each of the six different brands in terms of the central angles (in degrees) with respect to the total number of chairs produced in that year of all the six brands taken together.
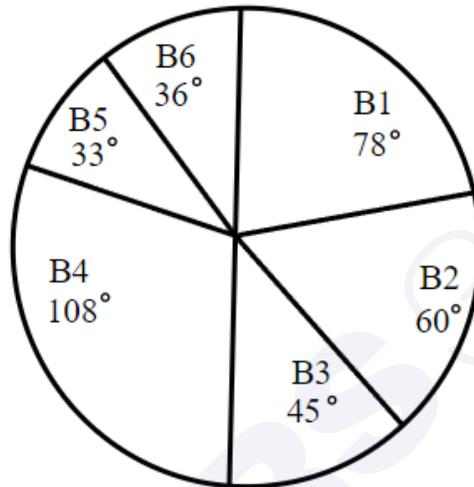
If the total number of chairs produced by these six brands taken together is 7200, then what is the total number of chairs produced by brands B2 and B3 taken together?

    A. 1750
    B. 2400
   C. 2100
    D. 1800

SOLUTION

From the pie chart,

The central angle for B2 is 60° and for B3 is 45°, giving a total of 105°.

The total central angle for all six brands is 360°.

Total chairs by B2 and B3 = (105° / 360°) × 7200 = 2100

Hence, the correct answer is 2100.

7. **Direction:** Go through the pie chart/s given below and answer the question that follows.

Book Section (Total Value = Rs. 146 Lakh)

Magazine Section (Total Value = Rs. 28 Lakh)
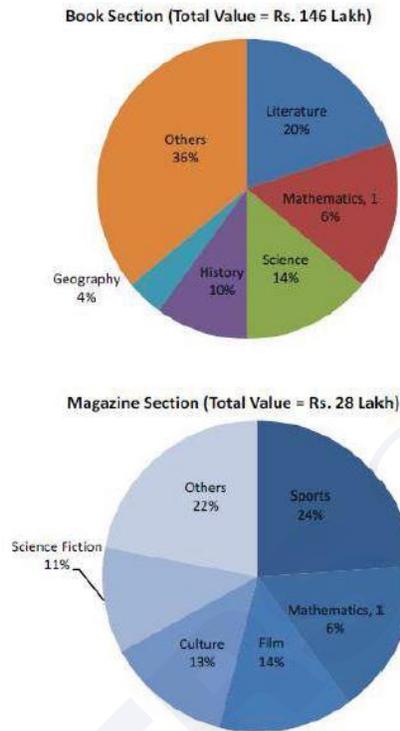
What is the amount of reading material available related to the science group in both sections put together as a percentage of the total value invested in the library?

- A. 16.5 %
- B. 1.55 %
- C. 13.5 %
- D. 18.4 %

SOLUTION

Correct Answer:- C
Explanation:-

(Book section) Science - 14% of 146-20.44 lakh (Magazine Section) Science - 11% of 28 = 3.08 lakhs. Total of science group = $20.44 + 3.08 = 23.52\ lakh$

$$^o/_o age = \frac{23.52}{174} \times 100 = 13.5^o/_o$$

8. **Direction:** Go through the pie chart/s given below and answer the question that follows.

Book Section (Total Value = Rs. 146 Lakh)
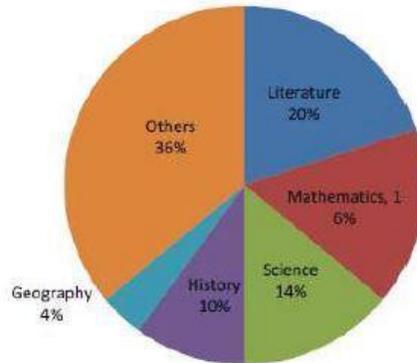
Magazine Section (Total Value = Rs. 28 Lakh)

What is the invested amount for literature as a percentage of the total investment of the library in books and magazine section?

- A. 16.8 %
- B. 15.5 %
- C. 13.6 %
- D. 14 %

SOLUTION

Correct Answer:- A
Explanation:-

Literature = 20% of 146 = 29.2 lakh Total investment in books and magazine section

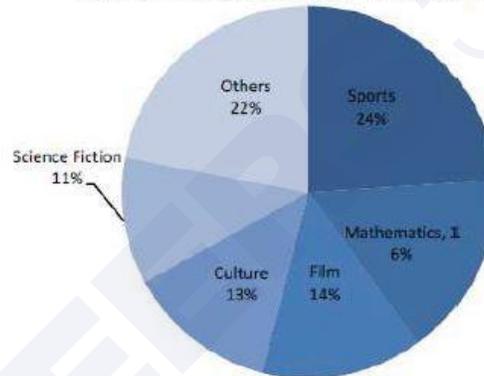$$= 146 \text{ lakh} + 28 \text{ lakh} = 174 \text{ lakh } \%\text{ age} = \frac{29.2}{174} \times 100 = 16.8 \%$$

9. **DIRECTIONS:** Go through the pie chart/s given below and answer the question that follows.

Book Section (Total Value = Rs. 146 Lakh)
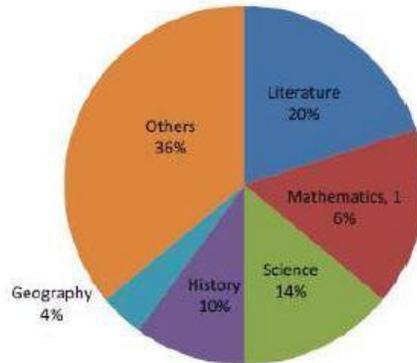
Magazine Section (Total Value = Rs. 28 Lakh)
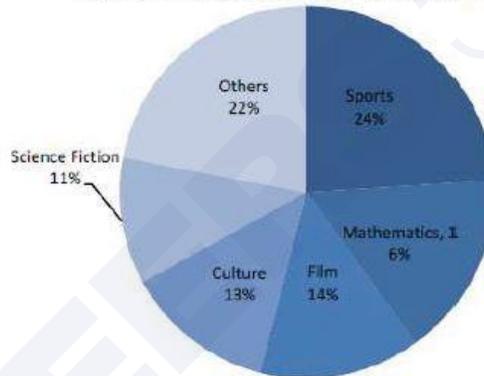
Which of the following statements is false?

- A. Literature, Mathematics and Science groups comprise nearly 50% of the book section.
- B. Sports, Culture and Film account for more than half of the magazines.
- C. The value of Sports magazines is higher than that of Geography books.
- D. None of these

SOLUTION

Correct Answer:- D
Explanation:-

Options (1) & (2) can be clearly seen as from the pie chart given And option (3) can be calculated as 24% of 28 lakh
= 6.72 lakh & 4 % of 146 lakh = 5.84 lakh, So clearly value of sports magazine is more. So all the statements are true and the answer will be none of these.

10. **DIRECTIONS:** Go through the pie chart/s given below and answer the question that follows.

Book Section (Total Value = Rs. 146 Lakh)
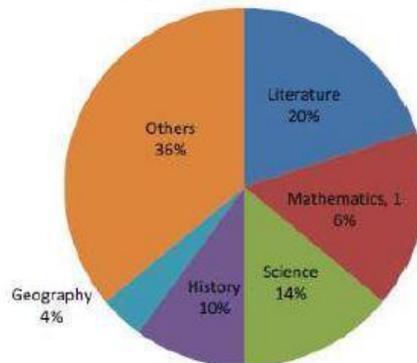
Magazine Section (Total Value = Rs. 28 Lakh)
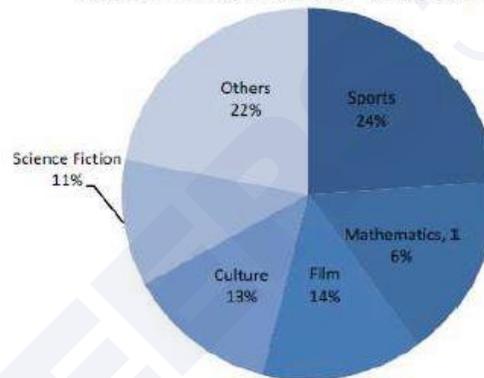
By how much percentage is the value of history books higher than that of film magazines?

A. 172 %
B. 27.2 %
C. 272 %
D. 72 %

SOLUTION

Correct Answer:- C
Explanation:-

History books = 10 % of 146 =14.6 lakh, Film magazines = 14 % of 28 = 3.92 lakh

% age = $\dfrac{14.6 - 3.92}{3.92} \times 100 = 272 \,°/_o$

PRACTICE EXERCISES

1. **DIRECTIONS :** Go through the pie chart/s given below and answer the question that follows.

Sale of Cycles of Different Colours
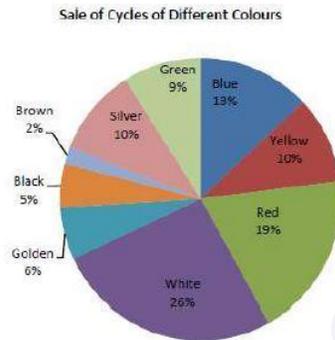
Cycles of which color are 20 % less popular than white coloured cycles directly in percentage?

    A. Black
    B. Golden
    C. Blue
    D. Red

2. **DIRECTIONS :** Go through the pie chart/s given below and answer the question that follows.

Sale of Cycles of Different Colours
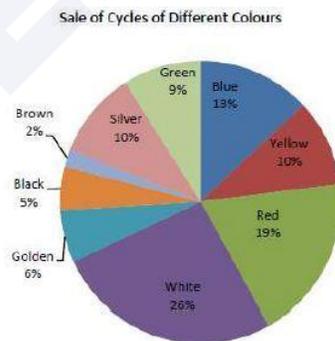
If in a certain period the total production of all cycles was 95,400, then how many more blue cycles were sold than green?

    A. 2580
    B. 3618
    C. 2850
    D. 3816

3. **DIRECTIONS :** Go through the pie chart/s given below and answer the question that follows.

Sale of Cycles of Different Colours
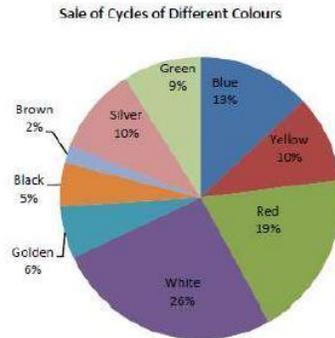
Cycles of which color when increased by two per cent and then combined with that of red cycles will make 30 percent of the total?

   A. Golden
   B. Blue
   C. Black
   D. None of these

4. **DIRECTIONS :** Go through the pie chart/s given below and answer the question that follows.

Sale of Cycles of Different Colours
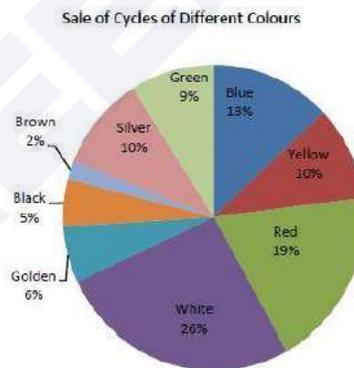
Which of the following color options consists of 50 % of all the cycles?

   A. Black, Golden, Blue, Red
   B. Blue, Black, Red, Silver
   C. White, Golden, Blue, Black
   D. None of these

5. Direction: Study the pie chart and answer the question

Details of % of employees working in various departments and number of males among them

Total number of employees = 800

Department	NO. of Males
Production	245
HR	12
IT	74
Marketing	165
Accounts	93

The respective ratio between the no. of female employees working in the HR department of the total number of employees working in the HR department is:

A. 7 : 10
B. 8 : 17
C. 8 : 19
D. 5 : 7

ANSWER KEY

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1 - B, 2 - B, 3 - D, 4 - C, 5 - A

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SOLUTIONS

1. **Correct Answer:- B**
Explanation:-

Clearly from pie chart, golden coloured is 20 % less popular than white coloured.

2. **Correct Answer:- D**
Explanation:-

If total = 95400, blue cycles = 13 % of 95400 = 12402. Green Cycles = 9 % of 95400 = 8586. So difference = 3816.

3. **Correct Answer:- D**
Explanation:-

The sale of green cycles is 9% and that of red cycles is 19%. Hence green cycles if increased by 2% and then combined with red
cycles will make 30% of the total. Hence answer is 4th option.

4. **Correct Answer:- C**

Explanation:-

From the pie chart we can see that

$$\text{White} + \text{Golden} + \text{Blue} + \text{Black} = 26 + 6 + 13 + 5 = 50\,{}^o\!/_o$$

5. Number of employees in HR department = (5/100) × 800 = 40

Numbers of females = 40 – 12 = 28

∴ Ratio = 28 : 40 = 7 : 10

Hence, the correct answer is 7 : 10.

LINE CHARTS

- Line graphs, also known as line charts, are a visual representation of data that show trends and changes over a continuous period.
- They are especially useful for displaying data that varies continuously, such as temperature, stock prices, or population growth.
- Line graphs use data points connected by lines to illustrate how values change over time or across a continuous variable.

Key Components of Line Graphs:

- Data Points (Markers):
  - Each data point on a line graph represents a specific value at a particular point in time or along a continuous scale.
  - Data points are marked on the graph to visualize the values accurately.
- Lines:
  - Lines connect the data points, forming a continuous curve or line that represents the changes in data over the given period.
  - The shape of the line provides insights into the overall trend.
- Axes:
  - Line graphs have two axes: the horizontal (x) axis and the vertical (y) axis.
  - The x-axis typically represents time, months, or a continuous variable.
  - The y-axis displays the corresponding values or measurements.

Interpreting Line Graphs:

- Line graphs are ideal for comparing changes in data across the same period for different groups or variables.
- They help us visualize trends, patterns, and variations in data over time.

Example: Temperature Over a Year

Temperature (°C) vs. Month
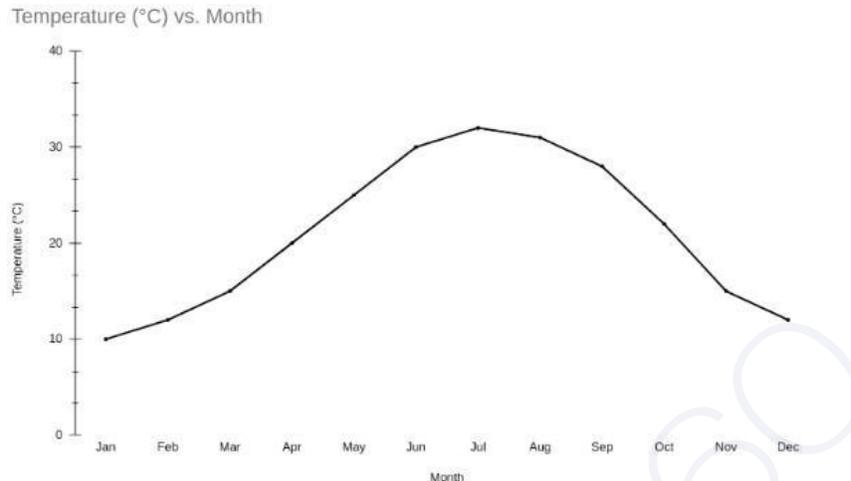
Interpretation:

- The x-axis represents the months of the year from January (Jan) to December (Dec).
- The y-axis represents the average monthly temperature in degrees Celsius (°C).
- The line connects data points to show the trend in temperature over the year.

Key Observations:

- Temperature Variation: The temperature starts low in January and gradually increases, peaking in July.
- Seasonal Patterns: From July onwards, the temperature decreases, reaching its lowest point in December.
- Cyclic Trend: The line graph reveals a cyclic trend of warming and cooling over the course of a year.

Sample Questions:

- What was the highest temperature recorded during the year?
  - Answer: The highest temperature recorded was around 32°C in July.
- In which month did the temperature experience the most significant increase?
  - Answer: The temperature experienced the most significant increase from March to July.
- What is the approximate difference in temperature between September and December?
  - Answer: The approximate difference in temperature between September and December is about 16°C (28°C - 12°C).

Conclusion: Line graphs are powerful tools for visualizing trends and changes over time or along a continuous scale. They facilitate the interpretation of data patterns and variations, making them essential for data analysis and effective communication of information. Mastery of line graph interpretation is valuable for a wide range of fields, from finance to climate science, as it enables informed decision-making based on data trends

SOLVED EXAMPLES OF LINE GRAPHS

Directions for question:

Mr Sonu Sood owned three cars – a BMW X7, a Mercedes GLE, and a Porsche Panamera. One day, he was studying the effect of tyre pressures (psi) of his cars on the top speed (kmph) that each car can reach, and the mileage (kmpl) – mileage being the distance that a car can travel using one liter of fuel – of each car.

The tyre pressure of any car should be at least 25 psi and at most 40 psi.

The first graph below provides the top speed that each car can reach for different tyre pressures.

The second graph provides the mileage of each car for different tyre pressures
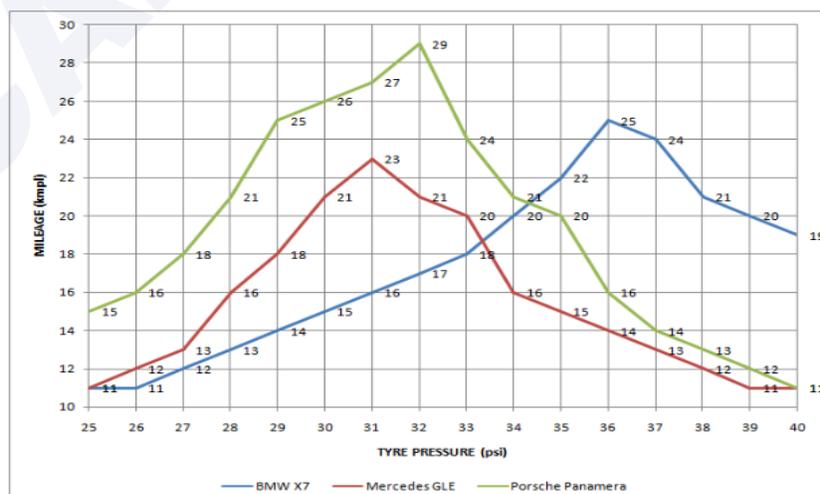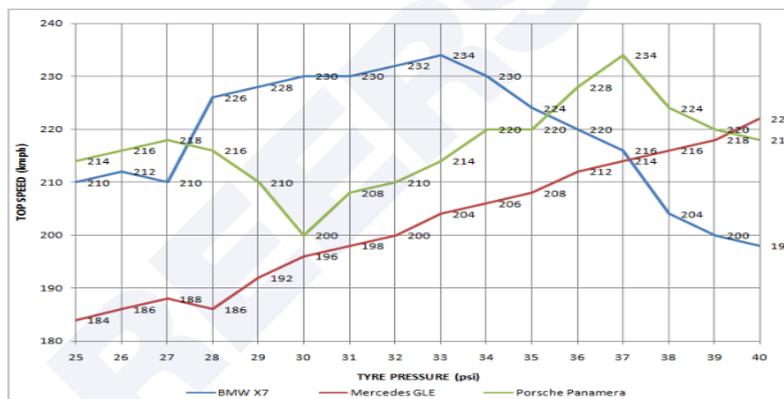
Question:

Q1:- Mr Sood wanted to set the same tyre pressure on all his cars. If he wanted all his cars to be able to reach a top speed of at least 200 kmph and have a mileage of at least 16 kmpl, which of the following could be the tyre pressure of his cars ?

Option-1 30 psi
Option-2 31 psi
Option-3 32 psi
Option-4 35 psi

Q 2:- If Mr Sood wanted to reach a top speed of at least 220 kmph and wanted to travel 50 km using at most 2 liters of petrol, which of the following combinations of car and tyre pressure had he to use ?

Option-1 Porsche Panamera, 37 psi
Option-2 Porsche Panamera, 32 psi
Option-3 Mercedes GLE, 40 psi
Option-4 BMW X7, 36 psi

Q 3:- If, during a journey in his Porsche Panamera, Mr Sood planned to maintain an average speed of at least 216 kmph for two hours, what was the minimum fuel that his car would consume during the two hours, assuming that his chauffeur could set the tyre pressure (in psi) accurately up-to one decimal place ?

Option-1 18.8 litres
Option-2 19.4 litres
Option-3 20.5 litres
Option-4 21.9 litres

Q 4:- If Mr Sood wanted to travel 40 km using at most 2 litres of fuel, what was the maximum speed (in kmph) that he could reach using any of the three cars ?

Solutions

Solution-1 By observation, we can see from the second graph that for all three cars to have a mileage of more than 16 kmpl, the tyre pressure must be in the range of 31 to 34 psi for all the three

In the first graph, between 32 to 34 psi, all three cars had a top speed greater than 200 kmph

Hence, from the given options, only 32 psi satisfies both the top speed and the mileage criteria for all the three cars

Solution-2 According to the question, the top speed must be 220 kmph and the mileage must be at least 25 kmpl.

Option A: For this combination, the top speed was 234 kmph and the mileage was 14 kmpl. Hence, this option does not satisfy

Option B: For this combination, the top speed was 210 kmph and the mileage was 29 kmpl. Hence, this option does not satisfy

Option C: For this combination, the top speed was 222 kmph and the mileage was 11 kmpl. Hence, this option does not satisfy too

Option D: For this combination, the top speed was 220 kmph and the mileage was 25 kmpl. Hence, this option satisfies

Thus if Mr Sood wanted to reach a top speed of at least 220 kmph and wanted to travel 50 km using at most 2 litres of petrol, he had to use a BMW X7 at 36 psi tyre pressure

Solution-3 The top speed of the Porsche Panamera must be at least 216 kmph, as given in the condition

Observing the first graph, this condition is satisfied for a tyre pressure in the range of 26 to 28 psi and 33.5 to 40 psi

Observing the second graph, the highest mileage in the range of 26 to 28 psi is 21 kmpl, and the highest mileage in the range of 33.5 to 40 psi is 23 kmpl

To ensure minimum fuel consumption, the highest mileage would be preferred by Mr Sood

Hence, to travel 216×2 = 432 km, the minimum fuel Mr Sood would need was 432/23 = 18.8 litres of petrol

Solution-4   The preferred mileage of Mr Sood was at least 40/2 = 20 kmpl

To attain at least 20 kmpl mileage, from the second and first graphs respectively :

For the BMW X7, the tyre pressure would be in the range of 34-39 psi and the top speed would be 230 kmph,

For the Porsche Panamera, the tyre pressure would be in the range of 28-35 psi and the top speed would be 220 kmph,

For the Mercedes GLE the tyre pressure would be in the range of 30-33 psi and the top speed would be 204 kmph.

Hence, the highest speed that Mr Sood could reach using any of the cars was 230 kmph.

SOLVED EXAMPLES

1. The following line graph shows the exports by company A and company B (in crores) over the five years 2010 to 2014.
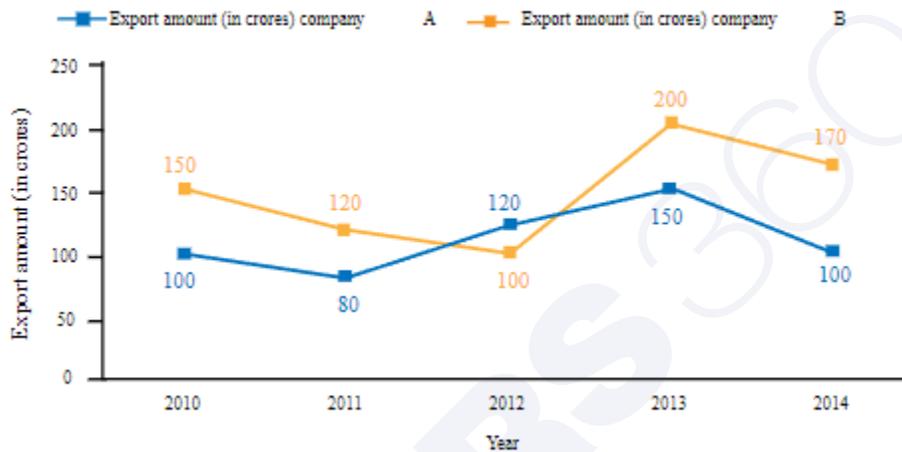
In which year, the difference between the export from company A and company B was maximum? (Currency is Indian rupees.)

   A. 2013
   B. 2014
   C. 2012
   D. 2011

SOLUTION

From the given graph:

The difference in the year 2010 = 150 – 100 = 50

The difference in the year 2011 = 120 – 80 = 40

The difference in the year 2012 = 120 – 100 = 20

The difference in the year 2013 = 200 – 150 = 50

The difference in the year 2014 = 170 – 100 = 70

The maximum difference is seen in 2014.

Hence, the correct answer is 2014.

2. The line graph shows the Production (in crores) of three companies over the years. Find the year in which total production in company Z is 30 percent more than that of company X.
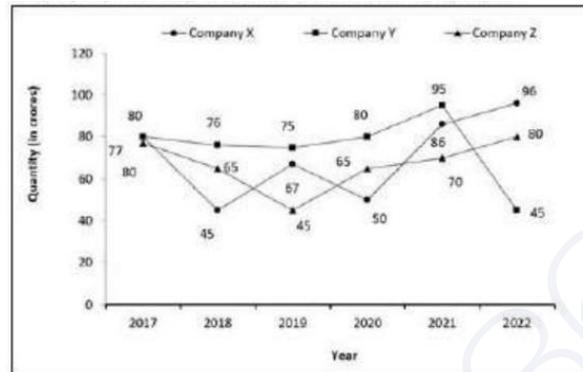
A. 2021
B. 2019
C. 2020
D. 2018

SOLUTION

Given,

Total production in company Z is 30 percent more than that of company X.

In the years 2018 and 2020, the production of Z is more than that of X.

In 2020,

⇒ (Production of Z / Production of X) × 100

⇒ (30% more than the production of X) × 100

3. Given is a line graph showing the number of accidents in a city during the first 6 months of 1999.
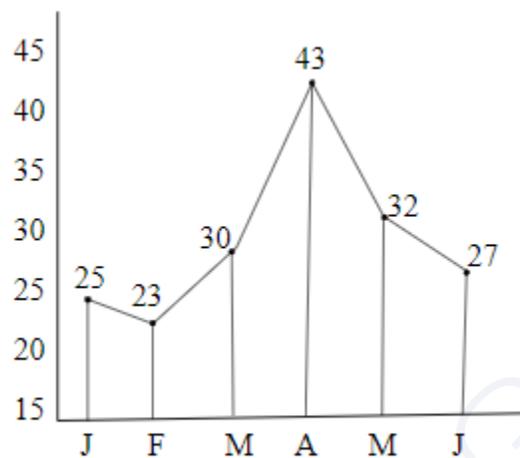
The decrease % of accidents from May to June is:

    A. 15 3/8%
    B. 15 1/8%
    C. 15 5/8%
    D. 15 7/8%

SOLUTION

Number of accidents in May = 32

Number of accidents in June = 27

Required percentage decrease = (32 - 27) / 32 × 100

= (5 × 100) / 32

= 125 / 8

= 15 5/8%

Hence, the answer is 15 5/8%.

4. The following line graph displays the ratio of exports to imports (in terms of money in INR crores) of company A from 2010 to 2015.

Study the graph carefully and answer the question based on the given line graph.

The Line graph displaying the ratio of Exports to Imports (in terms of money in Rs. crores) of company A from 2010 to 2015
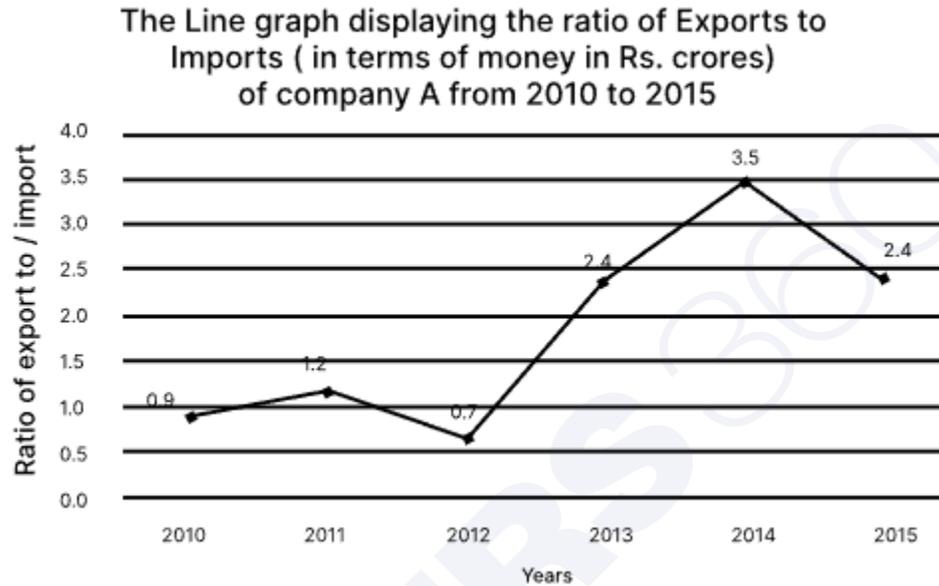
In how many years, the export of company A was more than the company's imports?

    A. Four
    B. Two
    C. Six
    D. Three

SOLUTION

Ratios = 0.9, 1.2, 0.7, 2.4, 2.5, 2.4

When the ratio is greater than 1, the export of company A will be more than the company's import.

Hence, the correct answer is Four.

5. **Direction:** Study the following line chart carefully and answer the questions given below it.

The line chart given below shows the number of units(in lakhs) of three different products-A,B and C- produced by company XYZltd.

from January to july in the year 2018. The company produces only these three types of products.
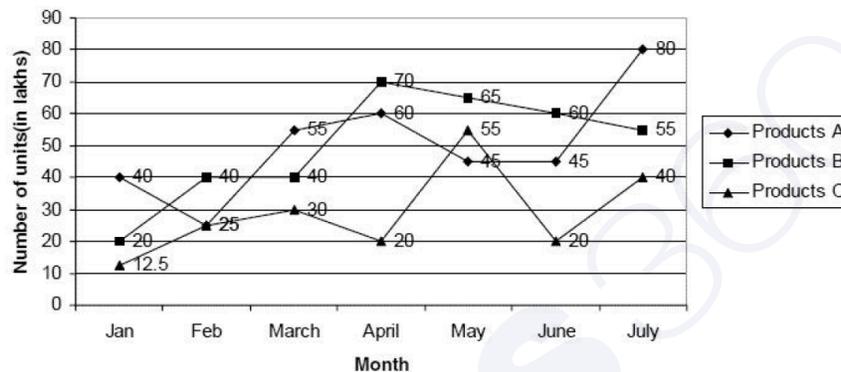
Q. In which of the following months is the number of units of product 'C' produced the same as the average number of units of the three products produced in that month?

    A. March
    B. April
    C. May
    D. June

SOLUTION

Average number of units (in lakhs) of three products produced in May $= \dfrac{165}{3} = 55$ and number of units (in lakhs) of product C produced in May = 55.

PRACTICE QUESTIONS

1. **DIRECTIONS:** Analyse the graph/s given below and answer the question that follows.

The following graph shows the ratio of imports to exports by two companies A and B over the years
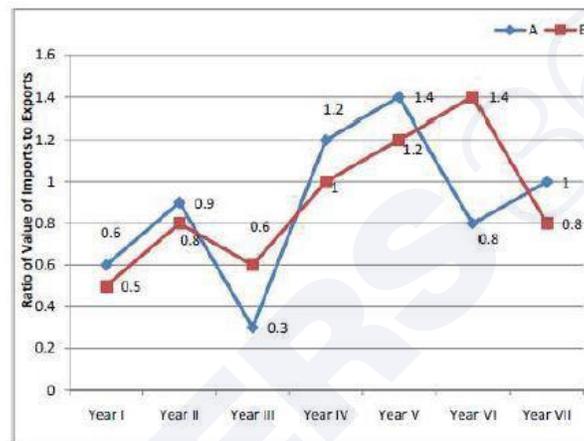
If the imports of company A in Year V were Rs. 8.40 crore, what were the exports of company B in Year VII?

  A. 6 crore
  B. 7.40 crore
  C. 7.20 crore
  D. Data inadequate

2. **DIRECTIONS:** Analyse the graph/s given below and answer the question that follows.

The following graph shows the ratio of imports to exports by two companies A and B over the years.
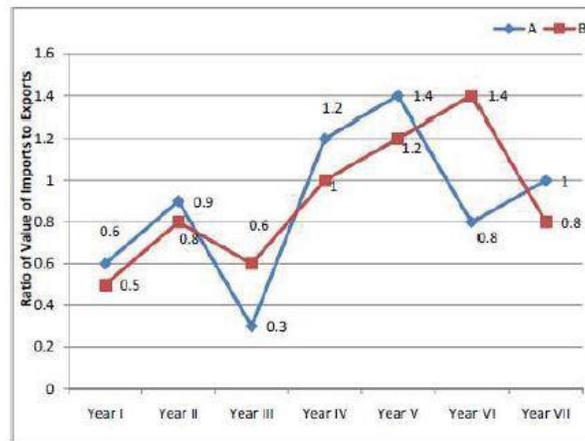
If the exports of company B in Year III were Rs. 2.19 crore, what were the imports of company B in the same year?

    A. 3.65 crore
    B. 7.40 crore
    C. 1.314 crore
    D. 1.414 crore

3. **DIRECTIONS:** Analyse the graph/s given below and answer the question that follows.

The following graph shows the ratio of imports to exports by two companies A and B over the years.
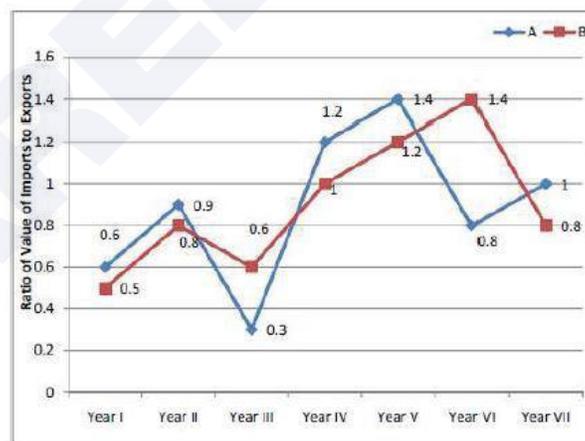
It is supposed that Imports – Exports = x for company A in Year I and the imports of company A in Year I were Rs. 3.6 crore, and
it is also supposed that Imports – Exports = a for company B in Year V and the exports of company B in Year V were Rs. 5 crore.
What is the relationship between a and x?

A. $x > a$
B. $x = a$
C. $a > x$
D. None of these

4. **DIRECTIONS:** Analyse the graph/s given below and answer the question that follows.

The following graph shows the ratio of imports to exports by two companies A and B over the years.
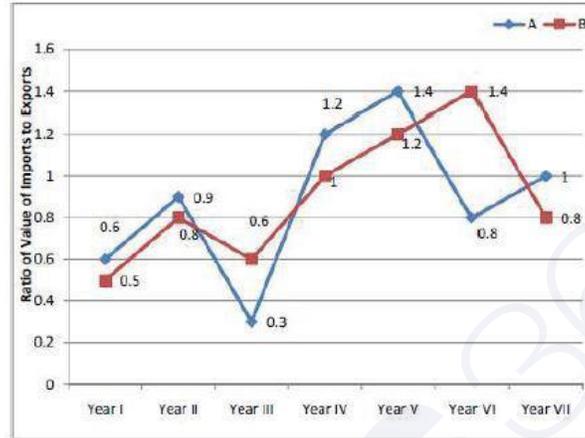
If the imports of company A in Year VI were Rs. 10.40 crore, what were the exports of company A in the same year?

    A. 13 crore
    B. 12.75 crore
    C. 12.50 crore
    D. None of these

5. **Direction :** Analyse the graph/s given below and answer the question that follows.

Study the following bar graph and line graph giving details of 'Number of Workers Employed' and ' Number of Units Shipped ' respectively of M/s Mega Corp Limited to answer the question.
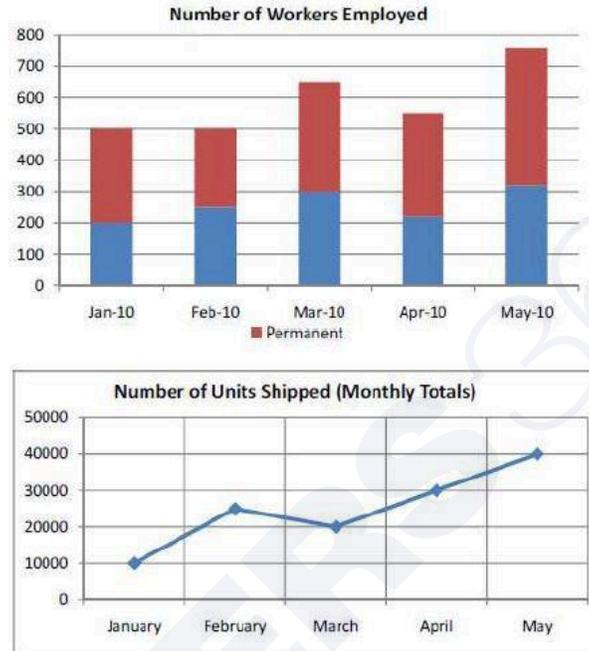
By what percent did the number of temporary workers employed by M/s Mega Corp Limited increase from April 1 to May 1?

    A. 45%
    B. 25%
    C. 20%
    D. 12%

ANSWER KEY

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1 - D, 2 - C, 3 - C, 4 - A, 5 - A

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1. **Correct Answer:- D**
Explanation:-

We cannot determine the exports of company B in Year VII on the basis of imports of company A.

2. Correct Answer:- C
Explanation:-

$$\frac{import}{2.19} = 0.6 \Rightarrow \text{Imports} = 0.6 \times 2.19 = 1.314 cr$$

3. Correct Answer:- C
Explanation:-

For A, x = import-exports (year) and the ratio is $\frac{1}{E} = 0.6$

Also $\frac{0.6}{1} = \frac{3.6}{E}$ solving we got $E - 6, So\ x - 3.6 - 6 - 2.4$

For B , a = Imports-Exports (YEAR V) and the ratio is $\frac{1}{E},\ \frac{1.2}{1} = \frac{1}{5}$

Solving we get $I = 6, So\ a = 6 - 5 = 1$

4. **Correct Answer:- A**
Explanation:-

Imort/Export = 0.8 $\Rightarrow$ 10.4/Export = 0.8 $\Rightarrow$ Export = 13 cr.

5. **Correct Answer:- A**
Explanation:-

No of temporary workers on April 1 = 220

No of Temporary workers on May 1 = 320

% age increase $= \frac{320 - 220}{220} \times 100 = 45\ ^o/_o$

BAR GRAPHS

A bar graph, also known as a bar chart, is a graphical representation of data using rectangular bars or columns. Each bar represents a category or a set of data, and its length or height is proportional to the value it represents. Bar graphs are widely used to compare and display data in a visually intuitive way.

Key Components of Bar Graphs:

- Bars: The bars in a bar graph are vertical or horizontal rectangles that visually represent data values. The length or height of each bar corresponds to the data it represents.
- Axes: Bar graphs have two axes: the horizontal (x) axis and the vertical (y) axis.

  The x-axis typically represents categories, while the y-axis represents the data values.

- Categories: Categories are the items or groups being compared in the bar graph. Each category is typically labelled on the x-axis.

Types of Bar Graphs:

- Vertical Bar Graphs: In a vertical bar graph, the bars are oriented vertically, with the categories along the horizontal axis and the values along the vertical axis.
- Horizontal Bar Graphs: In a horizontal bar graph, the bars are oriented horizontally, with the categories along the vertical axis and the values along the horizontal axis.

Interpreting Bar Graphs:

- Bar graphs are used to compare and contrast different categories or groups of data.
- They are effective for showing trends, differences, and relationships within data sets.

Example Bar Graph:

Let's consider an example bar graph with two products (Product A and Product B) to illustrate these concepts:

Sales (in $ thousands) vs. Month
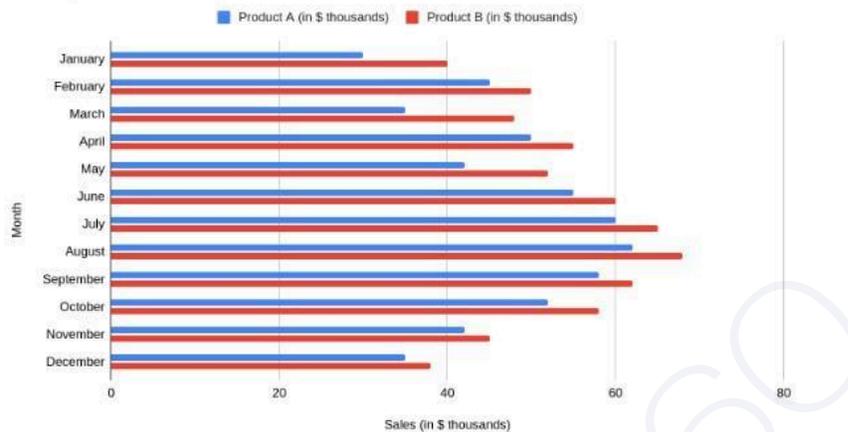
Interpreting the Example Bar Graph:

- This vertical bar graph represents the sales of two different products (A and B) over a year.
- The x-axis displays the product categories, while the y-axis shows the sales in thousands of dollars.
- Each bar represents the sales of a particular product, and the height of the bar corresponds to the sales value.

Sample Questions:

- Which product had the highest sales in February?

    Answer: Product B had the highest sales in February.

- What was the total sales of Product A over the entire year?

    Answer: The total sales of Product A over the entire year were $407,000.

- In which month did Product B have the lowest sales?

    Answer: Product B had the lowest sales in January.

Conclusion: Bar graphs are effective tools for comparing and visualizing data, making them valuable for various applications, including market research, business analysis, and academic presentations. Understanding how to interpret and analyze bar graphs is essential for making informed decisions based on data comparisons and trends. Regular practice with bar graph-based questions enhances your ability to extract insights from data representations accurately.

SOLVED EXAMPLES

BAR GRAPH - 1

1. The following bar graph shows the sales of books (in thousands) from six branches of a publishing company during two consecutive years 2018 and 2019.

Sales Of Books from Six Branches of Publishing Company
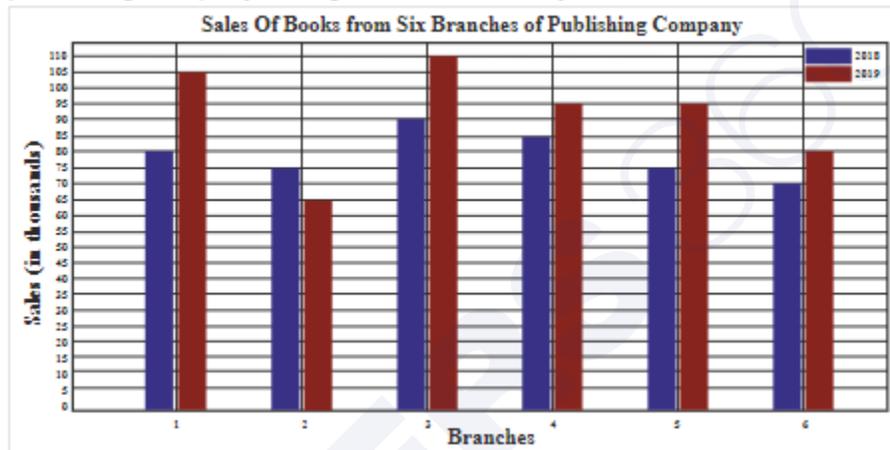
What is the ratio of the total sales of the first branch for both years to the total sales of the fourth branch for both years?

A. 4 : 3
B. 5 : 9
C. 8 : 11
D. 37 : 36

SOLUTION

Total sales of 1st branch for both the years = 80 + 105 = 185
Total sales of 4th branch for both the years = 85 + 95 = 180
Ratio of 1st to 4th = 185 : 180
= 37 : 36
Hence, the correct answer is 37 : 36.

2. What is the average sales of all the branches (in thousands) for the year 2018?

A. 84
B. 78
C. 80
D. 86

SOLUTION

Average sales of all the branches (in thousands) for the year 2018

= (80+75+95+85+75+70)/6
= 480/6
= 80

Hence, the correct answer is 80

BAR GRAPH - 2

The following bar chart shows the export of a certain commodity P in crore rupees between 2014 and 2020
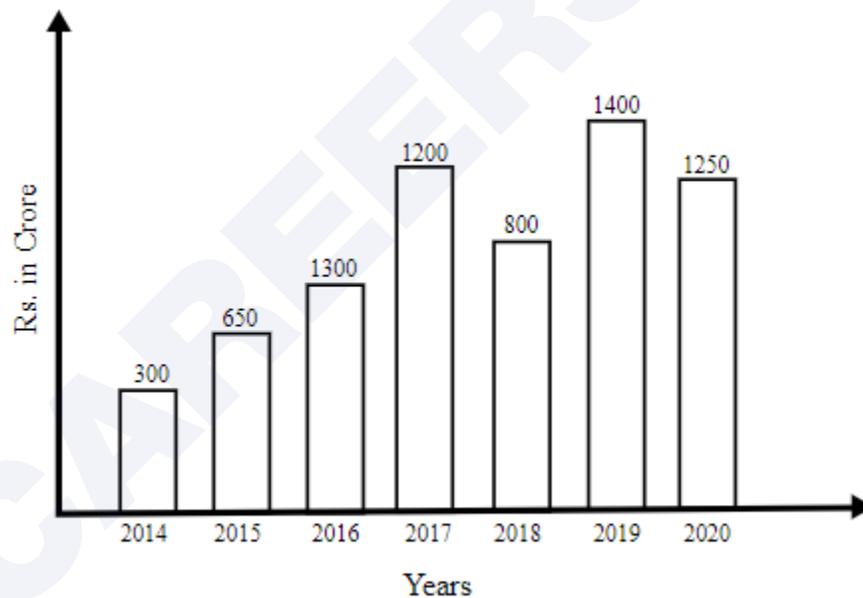
3. For how many years, there was less export of P than the average export of P?

    A. 2
    B. 1
    C. 4
    D. 3

SOLUTION

Average export of P

= (300+650+1300+1200+800+1400+1250)/7
= 6900/7
= 985.71

Number of years which have less export of P than the average export of P = 3

Hence, the correct answer is 3.

4. What was the percentage decrease in exports from 2016 to 2017?

A) 7.69%
B) 20%
C) 8.33%
D) 10%

SOLUTION

To calculate the percentage decrease in exports from 2016 to 2017, we first need to find the difference between the exports in 2016 and 2017, then divide that difference by the exports in 2016, and finally multiply by 100 to get the percentage.

Exports in 2016 = 1300 crore
Exports in 2017 = 1200 crore

Decrease = Exports in 2016 - Exports in 2017 = 1300 crore - 1200 crore = 100 crore

Percentage decrease = (Decrease / Exports in 2016) × 100
= (100 crore / 1300 crore) × 100
≈ (0.0769) × 100
≈ 7.69%

So, the correct answer is:

A) 7.69%

5. In which year did exports experience the highest percentage increase compared to the previous year?

A) 2016
B) 2017
C) 2018
D) 2019

SOLUTION

Percentage increase from year N to year N+1 can be calculated using the formula:

$$\text{Percentage Increase} = \left(\frac{\text{Exports in year N+1} - \text{Exports in year N}}{\text{Exports in year N}} \right) \times 100$$

Let's calculate the percentage increase for each year:

For 2015: Percentage Increase = ((650 - 300) / 300) × 100 ≈ 116.67%

For 2016: Percentage Increase = ((1300 - 650) / 650) × 100 = 100%

For 2017: Percentage Increase = ((1200 - 1300) / 1300) × 100 ≈ -7.69%

For 2018: Percentage Increase = ((800 - 1200) / 1200) × 100 ≈ -33.33%

For 2019: Percentage Increase = ((1400 - 800) / 800) × 100 = 75%

For 2020: Percentage Increase = ((1250 - 1400) / 1400) × 100 ≈ -10.71%

The highest percentage increase compared to the previous year is in 2015, with approximately 116.67%. Therefore, the correct answer is A) 2015.

6. What was the percentage increase in exports from 2018 to 2019?

A) 50%
B) 75%
C) 40%
D) 20%

SOLUTION

To calculate the percentage increase in exports from 2018 to 2019, we use the formula:

$$\text{Percentage Increase} = \left(\frac{\text{Exports in 2019} - \text{Exports in 2018}}{\text{Exports in 2018}}\right) \times 100$$

Given:

Exports in 2018 = Rs. 800 Crore
Exports in 2019 = Rs. 1400 Crore

$$\text{Percentage Increase} = \left(\frac{1400-800}{800}\right) \times 100$$

$$\text{Percentage Increase} = \left(\frac{600}{800}\right) \times 100$$

$$\text{Percentage Increase} = 0.75 \times 100$$

$$\text{Percentage Increase} = 75\%$$

So, the correct answer is:

B) 75%

7. What would be the expected exports in 2022 if exports continue to increase at an average rate of 10% per year?

A) Rs. 1650 Crore
B) Rs. 1512.5 Crore
C) Rs. 1400 Crore
D) Rs. 1600 Crore

SOLUTION

Given:

Exports in 2020 = Rs. 1250 Crore (based on the provided data)
Average annual growth rate = 10%

To estimate the expected exports in 2021, we can use the formula for compound interest:

$$\text{Expected Exports in 2021} = \text{Exports in 2020} \times (1 + \text{Average annual growth rate})$$

$$\text{Expected Exports in 2021} = 1250 \times (1 + 0.10)$$

$$\text{Expected Exports in 2021} = 1250 \times 1.10$$

$$\text{Expected Exports in 2021} = 1375$$

So, if exports continue to increase at an average rate of 10% per year, the expected exports in 2021 would be Rs. 1375 Crore.

Now, to estimate the expected exports in 2022:

$$\text{Expected Exports in 2022} = \text{Expected Exports in 2021} \times (1 + \text{Average annual growth rate})$$

$$\text{Expected Exports in 2022} = 1375 \times (1 + 0.10)$$

$$\text{Expected Exports in 2022} = 1375 \times 1.10$$

$$\text{Expected Exports in 2022} = 1512.5$$

So, if exports continue to increase at an average rate of 10% per year, the expected exports in 2022 would be approximately Rs. 1512.5 Crore.

BAR GRAPH - 3

8. The given bar diagram represents the number of persons who have taken an insurance policy on the y-axis and the year of purchase of the insurance policy on the x-axis.
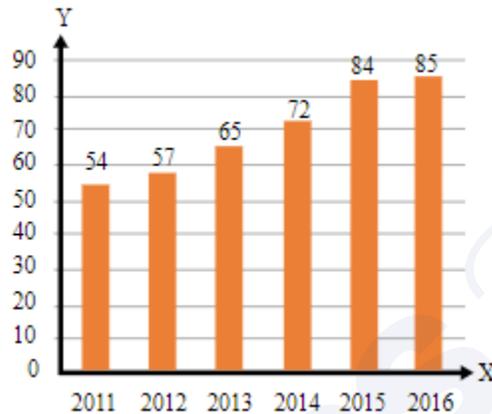
What is the approximate percentage of change in the number of persons who have taken the insurance policy in the year 2014 to that in the year 2011 (correct to one decimal place)?

A. 33.3%
B. 26.4%
C. 35.5%
D. 23.1%

SOLUTION

Number of persons who have taken the insurance policy in the year 2014 = 72
Number of persons who have taken the insurance policy in the year 2011 = 54
change in the number of persons who have taken the insurance policy in the year 2014 to that in the year 2011 = 72 – 54 = 18
So, the required percentage of change = (18/54)×100 = 33.3%

Hence, the correct answer is 33.3%.

9. What was the percentage increase in the number of people who took insurance policies from 2011 to 2016?

A) 52.7%
B) 57.4%
C) 61.8%
D) 66.6%

SOLUTION

To calculate the percentage increase in the number of people who took insurance policies from 2011 to 2016, you can use the following formula:

$$\text{Percentage Increase} = \frac{\text{Final Value} - \text{Initial Value}}{\text{Initial Value}} \times 100\%$$

Where:

Initial Value = Number of people who took insurance policies in 2011
Final Value = Number of people who took insurance policies in 2016

Let's calculate:

Initial Value (2011) = 54
Final Value (2016) = 85

$$\text{Percentage Increase} = \frac{85 - 54}{54} \times 100\%$$

$$= \frac{31}{54} \times 100\%$$

$$\approx 0.5741 \times 100\%$$

$$\approx 57.41\%$$

So, the percentage increase in the number of people who took insurance policies from 2011 to 2016 is approximately 57.41%.

10. In which year was there the smallest increase in the number of people who took insurance policies compared to the previous year?

A) 2012
B) 2013
C) 2015
D) 2016

SOLUTION

The year with the smallest increase in the number of people who took insurance policies compared to the previous year is 2016. In that year, the increase was only 1 person compared to 2015.

PRACTICE QUESTIONS

1. Based on the information given on authors vs books sold, answer the following questions by referring to the corresponding bar graph.

Books Sold by Author
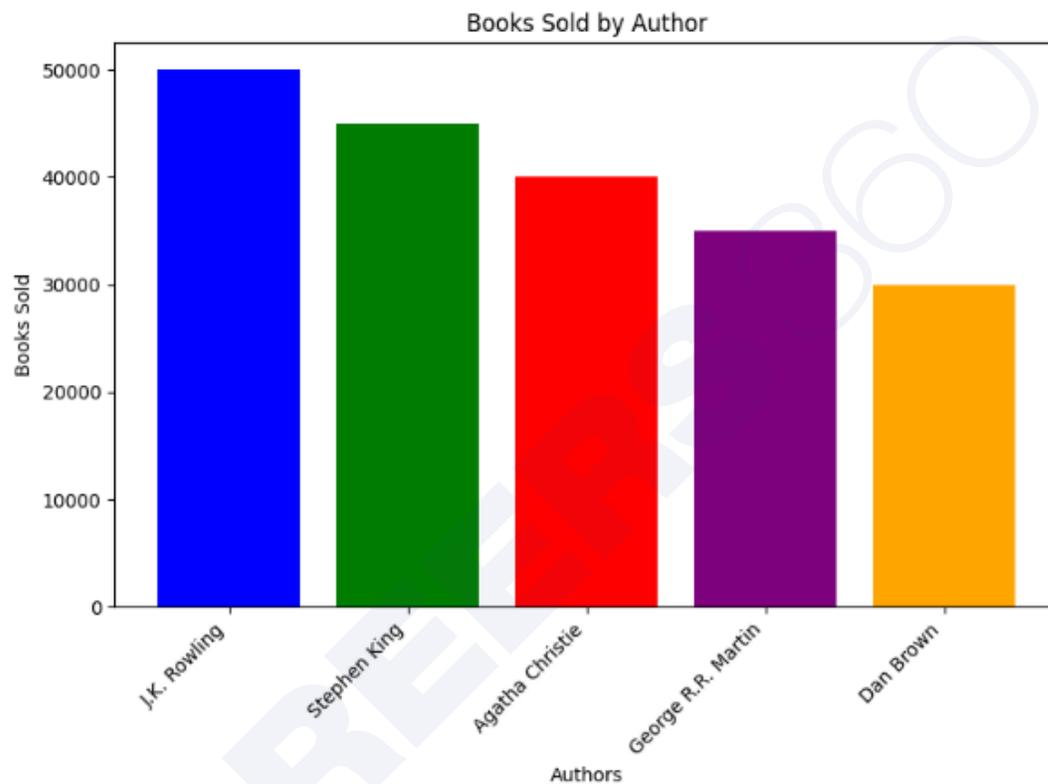
1. The percentage increase from the books sold of the author Stephen King to J.K. Rowling is:

A. 10%

B. 11 1/9%

C. 12%

D. 13%

2. In which comparison between two authors, the percentage difference in books sold is the highest?

A. J.K. Rowling to Agatha Christie

B. Agatha Christie to George R.R. Martin

C. George R.R. Martin to Stephen King

D. Stephen King to Dan Brown

3. What is the total increase in books sold from Dan Brown to J.K. Rowling over a decade?

A. 25,000 books

B. 20,000 books

C. 15,000 books

D. 10,000 books

4. What is the ratio of books sold by Dan Brown to George R.R. Martin?

A. 6:7

B. 7:6

C. 5:7

D. 7:5

5. How many authors have sold more copies than the average number of books sold?

A. 1

B. 2

C. 3

D. 4

<u>ANSWER KEY</u>

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1 - B, 2 - D, 3 - B, 4 - A, 5 - B

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SOLUTIONS

1. Stephen King's books sold: 45,000

J.K. Rowling's books sold: 50,000

To find the percentage increase, we use the formula:

Percentage Increase = $\left(\frac{\text{New Value}-\text{Old Value}}{\text{Old Value}}\right) \times 100\%$

Substituting the values:

Percentage Increase = $\left(\frac{50,000-45,000}{45,000}\right) \times 100\%$

$$= \left(\frac{5,000}{45,000}\right) \times 100\%$$

$$= \left(\frac{1}{9}\right) \times 100\%$$

$$\approx 11\frac{1}{9}\%$$

So, the percentage increase from Stephen King to J.K. Rowling is approximately 11 1/9%.

2. A. J.K. Rowling to Agatha Christie:
Percentage increase = ((40,000 - 50,000) / 50,000) × 100%
= (-10,000 / 50,000) × 100%
= -20%

B. Agatha Christie to George R.R. Martin:
Percentage increase = ((35,000 - 40,000) / 40,000) × 100%
= (-5,000 / 40,000) × 100%
= -12.5%

C. George R.R. Martin to Stephen King:
Percentage increase = ((45,000 - 35,000) / 35,000) × 100%
= (10,000 / 35,000) × 100%

≈ 28.57% ≈ 28 4/7%

D. Stephen King to Dan Brown:
Percentage increase = ((30,000 - 45,000) / 45,000) × 100%
= (-15,000 / 45,000) × 100%
= -33.33% ≈ -33 1/3%

To find the highest percentage difference between two authors' book sales, let's consider the absolute values of the calculated percentage increases:

A. Absolute value of -20% is 20
B. Absolute value of -12.5% is 12.5
C. Absolute value of 28 4/7% is 28 4/7
D. Absolute value of -33 1/3% is 33 1/3

The highest percentage difference is 33 1/3%, which corresponds to option D. So, the answer is: D Stephen King to Dan Brown.

3. To find the total increase in books sold from Dan Brown to J.K. Rowling:

J.K. Rowling's books sold: 50,000
Dan Brown's books sold: 30,000
Total increase = 50,000 - 30,000 = 20,000 books

So, the correct answer is:

B. 20,000 books

4. To express the ratio in simplest form as a fraction, we need to find the greatest common divisor (GCD) of 30,000 and 35,000 and then divide both numbers by this divisor.

30,000 and 35,000 have a GCD of 5,000.

Dividing both numbers by 5,000, we get:

30,000 ÷ 5,000 = 6

35,000 ÷ 5,000 = 7

So, the ratio of books sold by Dan Brown to George R.R. Martin in simplest form is 6/7 or 6:7

5. To find the number of authors who have sold more copies than the average of books sold, let's first calculate the average number of books sold among all authors using the given data:

Total number of books sold by all authors:
50,000 (J.K. Rowling) + 45,000 (Stephen King) + 40,000 (Agatha Christie) + 35,000 (George R.R. Martin) + 30,000 (Dan Brown) = 200,000

Average number of books sold per author:
Total number of books sold / Number of authors = 200,000 / 5 = 40,000

Now, let's find out how many authors have sold more copies than the average of 40,000 books:

J.K. Rowling - 50,000 books sold (More than average)
Stephen King - 45,000 books sold (More than average)
Agatha Christie - 40,000 books sold (Equal to average)
George R.R. Martin - 35,000 books sold (Less than average)
Dan Brown - 30,000 books sold (Less than average)

From the given data, 2 authors (J.K. Rowling and Stephen King) have sold more copies than the average of books sold.

So, the answer is 2 authors.

TABLE-BASED DATA INTERPRETATION

Introduction: Table-based Data Interpretation is a fundamental skill for understanding and drawing insights from data presented in tabular format. This skill is valuable for making informed decisions and solving real-world problems that involve data analysis. Here, we will explore the key principles and techniques involved in Table-based Data Interpretation.

1. Understanding Table Structure:

- Tables consist of rows and columns.
- The top row typically contains column headings or labels that describe the data within each column.
- Rows below the headings represent individual entities, such as products, time periods, or geographic regions.

2. Identifying Data Types:

- Tables can contain various types of data, including numerical values, percentages, text, or any other relevant information.
- It's essential to grasp the meaning and context of each column to interpret the data accurately.

3. Extracting Information:

- Carefully read any associated problem statement or context that specifies what information you need to extract or analyze from the table.

4. Recognizing Trends and Patterns:

- Examine the data for any discernible trends, patterns, or irregularities. These might include rising or falling values, similarities or differences between rows or columns, or any data outliers.

5. Performing Calculations:

- Many problems will require you to perform calculations based on the table data. Be prepared to calculate percentages, growth rates, averages, or other relevant metrics to answer questions accurately.

6. Units of Measurement:

- Pay close attention to the units of measurement used in the table, as these are critical for performing accurate calculations and interpreting the data correctly.

Example Table:

Let's consider an example table to illustrate these concepts:

Year	Revenue (in millions)	Expenses (in millions)	Profit Margin (%)
2019	100	70	30%
2020	120	85	29.2%
2021	140	95	32.1%
2022	160	110	31.25%

Analyzing the Example Table:

- This table represents the financial performance of an entity over four years.
- The "Year" column indicates the respective years.
- The "Revenue" and "Expenses" columns contain financial figures in millions.
- "Profit Margin" is presented as a percentage.

Interpreting the Data:

- You can observe that revenue has steadily increased over the years, from 100 million in 2019 to 160 million in 2022.
- Expenses have also risen, from 70 million in 2019 to 110 million in 2022.
- The "Profit Margin" column indicates the profitability, calculated as (Profit / Revenue) ×100. It fluctuates slightly but remains around 30%.

Sample Question: Given the data, you might be asked to determine the year with the highest profit margin. To answer this, calculate the profit margin for each year and compare the values.

Conclusion: Table-based Data Interpretation is a vital skill for anyone working with data. Mastering this skill enables you to make informed decisions and uncover insights from tables of information. Practice with a variety of tables and questions to strengthen your proficiency in interpreting data accurately.

SOLVED EXAMPLES

1. **Direction :** Study the following Graph & table given below and answer the question that follows.

Rate of Interest, Dividend Payout Ratio and the Retained Earnings of Five Companies

Company	Interest (Rs. 000)	Rate of Interest (%)	Dividend Payout Ratio (%)	Retained Earnings (Rs. lakh)
A	234	18	22.50	155
B	576	24	19.60	402
C	129.6	16	8.75	365
D	144	9	32.50	270
E	180	15	28.00	216

Profit earned is either paid out as dividend or ploughed back in business as retained earning. Interest is paid on borrowings
What is the sum of the borrowings of all five companies?

- A. Rs. 14.6 lakh
- B. Rs. 146 lakh
- C. Rs. 14.6 crore
- D. None of these

SOLUTION

Correct Answer:- D
Explanation:-

18% of Borrowing of A = 234 $\Rightarrow$ Borrowing of A = Rs. 1300000

24% of Borrowing of B = 576 $\Rightarrow$ Borrowing of B = Rs. 2400000. Difference = Rs. 1100000.

Likewise we can calculate the borrowings of all the companies.

Borrowing of A = 13 lakh, Borrowing of B = 24 lakh. Similarly we can find Borrowing of C as 8.1 lakh, Borrowing of D = 16 lakh and Borrowing of E = 12 lakh. Hence total Borrowing = 73.1 lakh.

2. **Direction :** Study the following Graph & table given below and answer the question that follows.

Rate of Interest, Dividend Payout Ratio and the Retained Earnings of Five Companies

Company	Interest (Rs. 000)	Rate of Interest (%)	Dividend Payout Ratio (%)	Retained Earnings (Rs. lakh)
A	234	18	22.50	155
B	576	24	19.60	402
C	129.6	16	8.75	365
D	144	9	32.50	270
E	180	15	28.00	216

Profit earned is either paid out as dividend or ploughed back in business as retained earning. Interest is paid on borrowings.
What is the sum of profits made by companies A and B?

    A. Rs. 600 lakh
    B. Rs. 500 lakh
    C. Rs. 700 lakh
    D. Rs. 800 lakh

SOLUTION

Correct Answer:- C
Explanation:-

Total profit for company B, $402 = \dfrac{80.4}{100}$ (Total profit) $\Rightarrow$ Total profit = 500 lakh

Profit made by company B = 500 lakh. Also, for company A, $155 = \dfrac{77.5}{100}$ (Total profit) $\Rightarrow$ Total profit = 200 lakh. So total = 700 lakh. Hence 3rd option.

3. **Direction :** Study the following Graph & table given below and answer the question that follows.

Rate of Interest, Dividend Payout Ratio and the Retained Earnings of Five Companies

Company	Interest (Rs. 000)	Rate of Interest (%)	Dividend Payout Ratio (%)	Retained Earnings (Rs. lakh)
A	234	18	22.50	155
B	576	24	19.60	402
C	129.6	16	8.75	365
D	144	9	32.50	270
E	180	15	28.00	216

Profit earned is either paid out as dividend or ploughed back in business as retained earning. Interest is paid on borrowings.
By how much does the dividend paid by company D exceed the dividend paid by company B?

    A. Rs. 32 lakh
    B. Rs. 23 lakh
    C. Rs. 320 lakh
    D. Rs. 230 lakh

SOLUTION

Correct Answer:- A
Explanation:-

Dividend paid bycompany D: $270 = \dfrac{67.50}{100}$ (Total Profit) $\Rightarrow$ Total profit - 400 lakh.

So dividend paid - $400 \times \dfrac{32.5}{100} = 130 \, lakhs.$ Also for company B, $402 = \dfrac{80.4}{100}$ (Total profit)

$\Rightarrow$ Total profit - 500 lakh. So dividend paid - $500 \times \dfrac{19.6}{100} = 98 \, lakh$

Hence dividend paid by company D exceeds dividend paid by company B by $130 - 98 = 32 \, lakh$. Hence 1st option.

4. **Direction :** Study the following Graph & table given below and answer the question that follows.

Rate of Interest, Dividend Payout Ratio and the Retained Earnings of Five Companies

Company	Interest (Rs. 000)	Rate of Interest (%)	Dividend Payout Ratio (%)	Retained Earnings (Rs. lakh)
A	234	18	22.50	155
B	576	24	19.60	402
C	129.6	16	8.75	365
D	144	9	32.50	270
E	180	15	28.00	216

Profit earned is either paid out as dividends or ploughed back in business as retained earnings. Interest is paid on borrowings.
By how much do the borrowings of company B exceed that of company A?

   A. Rs.13,20,000
   B. Rs.12,10,000
   C. Rs.10,00,000
   D. Rs.11,00,000

SOLUTION

Correct Answer:- D
Explanation:-

18 % Borrowing of A - 234 $\Rightarrow$ Borrowing of A - Rs. 1300000

24 % Borrowing of B - 576 $\Rightarrow$ Borrowing of B - Rs. 2400000

Difference - Rs. 1100000.

5. The table given below shows the number of persons participating in a survey from 6 different states.

States	Persons
S1	100
S2	200
S3	400
S4	500
S5	600
S6	800

What is the ratio of number of person participating in a survey from state S3 to the number of person participating in a survey from state S4?

A. 3 : 5
B. 5 : 4
C. 4 : 3
D. 4 : 5

SOLUTION

The number of persons participating in a survey from state S3 = 400

The number of persons participating in a survey from state S4 = 500

Required ratio = 400 : 500 = 4 : 5

Hence, the correct answer is 4 : 5.

6. The table given below shows the number of spoon manufactured by five factories.

Factory	Spoon
P	100
Q	200
R	150
S	50
T	250

What are the ratio of number of spoon manufactured by P to the number of spoon manufactured by R?

A. 3 : 2
B. 2 : 3
C. 14 : 1
D. 1 : 3

SOLUTION

Ratio of the number of spoons manufactured by P to the number of spoons manufactured by R

= 100 : 150

= 2 : 3

Hence, the correct answer is 2 : 3.

7. The following table shows the marks (in percentages) obtained by six students in four different subjects in on examination. Maximum marks in each subject are 100. Answer the following question based on the table:

Student	Subject			
	SST	PHYSICS	CHEMISTRY	MATHS
A	92	90	90	80
B	90	80	85	85
C	80	80	65	70
D	85	80	82	75
E	80	75	75	85
F	90	90	90	85

What is the number of students whose overall percentage obtained is 80% and above?

    A. 4
    B. 5
    C. 2
    D. 3

SOLUTION

Maximum marks = 400

Marks obtained by A = 92 + 90 + 90 + 82 = 352

Percentage of A = (352 / 400) × 100 = 88%

Marks obtained by B = 90 + 80 + 85 + 85 = 340

Percentage of B = (340 / 400) × 100 = 85%

Marks obtained by C = 80 + 80 + 65 + 70 = 295

Percentage of C = (295 / 400) × 100 = 73.75%

Marks obtained by D = 85 + 80 + 82 + 75 = 322

Percentage of D = (322 / 400) × 100 = 80.5%

Marks obtained by E = 80 + 75 + 75 + 85 = 315

Percentage of E = (315 / 400) × 100 = 78.75%

Marks obtained by F = 90 + 90 + 90 + 85 = 355

Percentage of F = (355 / 400) × 100 = 88.75%

Only four students' overall percentage is 80% and above.

Hence, the correct answer is 4.

8. Refer to the table below and answer the questions that follow

TV Show	Viewership
Game of Thrones	10,000
Breaking Bad	8,500
Friends	7,000
The Office	6,500
Stranger Things	5,500

How many shows have fewer viewers than the average viewership?

A. Friends

B. The Office

C. Stranger Things

D. All of the above

SOLUTION

To determine the number of TV shows with fewer viewers than the average viewership, let's first calculate the average viewership among all shows using the given data:

Total viewership of all shows:
10,000 (Game of Thrones) + 8,500 (Breaking Bad) + 7,000 (Friends) + 6,500 (The Office) + 5,500 (Stranger Things) = 37,500

Average viewership per show:
Total viewership / Number of shows = 37,500 / 5 = 7,500

Now, let's count the number of shows with fewer viewers than the average of 7,500:

Game of Thrones - 10,000 viewers (More than average)
Breaking Bad - 8,500 viewers (More than average)
Friends - 7,000 viewers (Less than average)
The Office - 6,500 viewers (Less than average)
Stranger Things - 5,500 viewers (Less than average)
From the given data, 3 TV shows (Friends, The Office, and Stranger Things) have fewer viewers than the average viewership.

So, the answer is D. All of the above

9. How many more views does the TV show "Stranger Things" require to surpass the average view count?

A. 1,500 views

B. 2,000 views

C. 2,500 views

D. 3,000 views

SOLUTION

To find out how many more views the TV show "Stranger Things" requires to surpass the average view count, we need to calculate the difference between the average view count and the current view count of "Stranger Things."

Average view count among all shows: 7,500

Current view count of "Stranger Things": 5,500

Difference = Average view count - Current view count
= 7,500 - 5,500
= 2,000

So, "Stranger Things" requires 2,000 more views to surpass the average view count.

10. What is the ratio of the original viewership of Game of Thrones to the updated viewership if the viewership of Game of Thrones is projected to dip by 30%?

A. 10:7

B. 7:10

C. 3:7

D. 7:3

SOLUTION

To find the ratio of the original viewership of Game of Thrones to the updated viewership after a projected 30% decrease, we first need to calculate the updated viewership.

Let's denote the original viewership as V. After a 30% decrease, the updated viewership will be 70% of the original viewership.

Updated viewership = 0.70 ×Original viewership

Now, let's calculate this:

Original viewership of Game of Thrones: 10,000

Updated viewership = 0.70 ×10,000 = 7,000

The ratio of the original viewership to the updated viewership is:

Ratio = Original viewership / Updated viewership

Ratio = 10,000 / 7,000

Now, simplify the ratio:

Ratio = 10,000 / 7,000 = 10/7 or 10:7

Refer to the table below and answer the questions that follow.

Manufacturer	Cars Manufactured in 2016	Cars Manufactured in 2017
Toyota	50,000	55,000
Ford	45,000	47,500
Honda	40,000	42,500
General Motors	35,000	37,500
Volkswagen	30,000	32,500

1. Which company had the greatest percentage change from the previous year and by what percentage?

A. Toyota, 10%

B. Ford, 5.56%

C. General Motors, 7.14%

D. Volkswagen, 8.33%

2. What is the ratio of the number of cars manufactured by Toyota in 2016 to the number of cars manufactured by General Motors in 2017?

A. 4:3

B. 3:4

C. 5:3

D. 3:5

3. To maintain the same increase pace as from 2016 to 2017, by how much should Toyota target to increase their production in 2018?

A. 2,500 cars

B. 4,500 cars

C. 5,500 cars

D. 6,500 cars

4. If the production of Volkswagen cars is estimated to increase by 10% in 2018 and subsequently reduced by 20% in 2019, find the number of cars they would make in 2019.

A. 27,200 cars

B. 28,600 cars

C. 29,800 cars

D. 30,400 cars

5. What is the difference between the total number of cars manufactured in 2016 and 2017?

A. 5,000 cars

B. 10,000 cars

C. 15,000 cars

D. 20,000 cars

ANSWER KEY

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1 - A, 2 - A, 3 - C, 4 - B, 5 - C

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SOLUTIONS

1. To determine which company had the greatest percentage change from the previous year and by what percentage, we'll calculate the percentage change for each company and then identify the company with the highest percentage change.

Let's calculate the percentage change for each company:

For Toyota:
Percentage change = ((55,000 - 50,000) / 50,000) × 100% = 10%

For Ford:
Percentage change = ((47,500 - 45,000) / 45,000) × 100% ≈ 5.56%

For Honda:
Percentage change = ((42,500 - 40,000) / 40,000) × 100% = 6.25%

For General Motors:
Percentage change = ((37,500 - 35,000) / 35,000) × 100% ≈ 7.14%

For Volkswagen:
Percentage change = ((32,500 - 30,000) / 30,000) × 100% ≈ 8.33%

Now, let's compare these percentage changes to find the highest one:

Toyota: 10%
Ford: 5.56%
Honda: 6.25%
General Motors: 7.14%
Volkswagen: 8.33%
The greatest percentage change is 10% for Toyota.

So, Toyota had the greatest percentage change from the previous year, and it increased by 10%.

2. To find the ratio of the number of cars manufactured by Toyota in 2016 to the number of cars manufactured by General Motors in 2017, let's first gather the relevant data:

Number of cars manufactured by Toyota in 2016: 50,000
Number of cars manufactured by General Motors in 2017: 37,500
Now, let's calculate the ratio:

Ratio = Number of cars manufactured by Toyota in 2016 / Number of cars manufactured by General Motors in 2017

Ratio = 50,000 / 37,500

Now, let's simplify the ratio:

Ratio = 50,000 / 37,500 = 4 / 3

So, the ratio of the number of cars manufactured by Toyota in 2016 to the number of cars manufactured by General Motors in 2017 is 4:3.

3. To maintain the same increase pace as from 2016 to 2017, we need to find the percentage increase in Toyota's production from 2016 to 2017. Then, we'll use this percentage increase to calculate the target increase for 2018.

From the given data:

Number of cars manufactured by Toyota in 2016: 50,000
Number of cars manufactured by Toyota in 2017: 55,000
Percentage increase from 2016 to 2017:

$$\text{Percentage increase} = \left(\frac{\text{New value} - \text{Old value}}{\text{Old value}}\right) \times 100\%$$

$$\text{Percentage increase} = \left(\frac{55,000 - 50,000}{50,000}\right) \times 100\% = \left(\frac{5,000}{50,000}\right) \times 100\% = 10\%$$

Now, to maintain the same increase pace, Toyota should target to increase their production in 2018 by 10% from the production in 2017.

Target increase for 2018:

$$\text{Target increase} = 10\% \times 55,000$$

$$\text{Target increase} = 0.10 \times 55,000 = 5,500$$

So, Toyota should target to increase their production in 2018 by 5,500 cars to maintain the same increase pace.

4.First, we calculate the production of Volkswagen cars in 2018 (denoted as V_{2018}) by adding a 10% increase to the production in 2017 (given as 32,500 cars):

V_{2018} = 32,500 + (0.10 × 32,500) = 32,500 + 3,250 = 35,750 cars

Then, we calculate the production of Volkswagen cars in 2019 (denoted as V_{2019}) by subtracting a 20% reduction from the production in 2018:

V_{2019}= 35,750 - (0.20 × 35,750) = 35,750 - 7,150 = 28,600 cars

So, Volkswagen would make 28,600 cars in 2019 after the estimated 10% increase in production in 2018 followed by a 20% reduction in 2019.

5. find the difference between the total number of cars manufactured in 2016 and 2017, we'll sum up the number of cars manufactured in each year and then calculate the difference between these totals.

Given the data:

Total number of cars manufactured in 2016: 50,000 (Toyota) + 45,000 (Ford) + 40,000 (Honda) + 35,000 (General Motors) + 30,000 (Volkswagen) = 200,000 cars

Total number of cars manufactured in 2017: 55,000 (Toyota) + 47,500 (Ford) + 42,500 (Honda) + 37,500 (General Motors) + 32,500 (Volkswagen) = 215,000 cars

Difference = Total number of cars manufactured in 2017 - Total number of cars manufactured in 2016

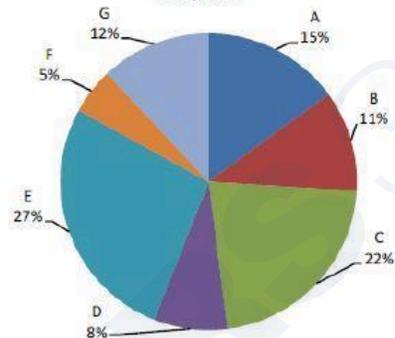= 215,000 - 200,000

= 15,000 cars

So, the difference between the total number of cars manufactured in 2016 and 2017 is 15,000 cars.

MIXED GRAPHS

SOLVED EXAMPLES

1. **DIRECTION:** Go through the pie chart/s given below and answer the question that follows.

Percentages of the Total Production by the Seven Companies

Cost of the total production (both items together) by seven companies = Rs. 25 crore.

Ratio of production between items I and II and the percent profit earned for the two items.

Company	Ratio of Production		Percentage Profit Earned	
	Item I	Item II	Item I	Item II
A	2	3	25	20
B	3	2	32	35
C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30	24

Cost of production of item I by company F is what percent of the cost of production of item II by company D?

A. 16 %
B. 33.33 %
C. 20 %
D. 12.5 %

SOLUTION

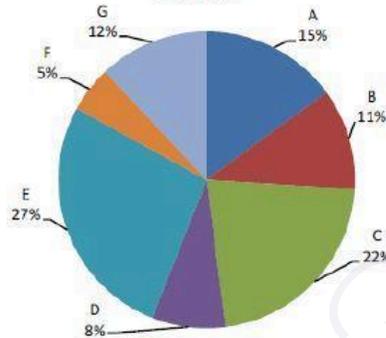**Correct Answer:- C**
Explanation:-

$\dfrac{1}{5}$ of 5 % : $\dfrac{5}{8}$ of 8 % = 1:5 = 20%

2. **DIRECTION:** Go through the pie chart/s given below and answer the question that follows.

Percentages of the Total Production by the Seven Companies

Cost of the total production (both items together) by seven companies = Rs. 25 crore.

Ratio of production between items I and II and the percent profit earned for the two items.

Company	Ratio of Production		Percentage Profit Earned	
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C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30	24

What is the total cost of the production of item I by companies A and C together (in Rs. crore)?
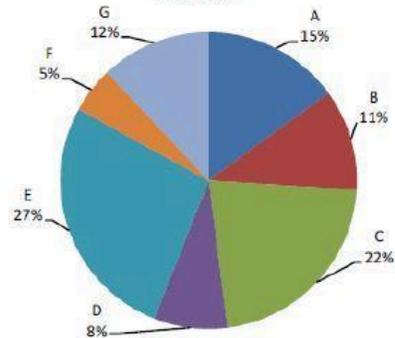
A. 9.25
B. 5.9
C. 4.1625
D. None of these

SOLUTION

Correct Answer:- B
Explanation:-

$\dfrac{2}{5}$ of 15 % of 25 cr + $\dfrac{4}{5}$ of 22 % of 25 cr = 5.9 cr.

3. **DIRECTION:** Go through the pie chart/s given below and answer the question that follows.

Percentages of the Total Production by the Seven Companies

Cost of the total production (both items together) by seven companies = Rs. 25 crore.

Ratio of production between items I and II and the percent profit earned for the two items.

Company	Ratio of Production		Percentage Profit Earned	
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B	3	2	32	35
C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30	24

What is the total of the profit earned by company B on production of item I and the profit earned by company A on production
of item II?

A. Rs. 9.78 crore
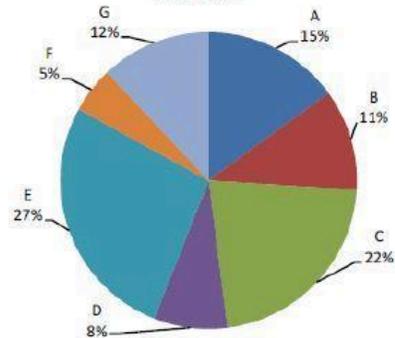B. Rs. 97.8 lakh
C. Rs. 52.8 lakh
D. Rs. 30.65 lakh

SOLUTION

Correct Answer:- B
Explanation:-

32% of $\frac{3}{5}$ of 11% of 25 cr +20 % of $\frac{3}{5}$ of 15 % of 25 cr = Rs. 97.8 lakh

4. **DIRECTION:** Go through the pie chart/s given below and answer the question that follows.

Percentages of the Total Production by the Seven Companies

Cost of the total production (both items together) by seven companies = Rs. 25 crore.

Ratio of production between items I and II and the percent profit earned for the two items.

Company	Ratio of Production		Percentage Profit Earned	
	Item I	Item II	Item I	Item II
A	2	3	25	20
B	3	2	32	35
C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30	24

What is the total profit earned by company G for items I and II together?

A. Rs. 78 lakh
B. Rs. 1.62 crore
C. Rs. 16.2 lakh
D. None of these

SOLUTION

Correct Answer:- A
Explanation:-
Item I is 4 % and item II is 8 % of the total(The total production share is 12% and it is in the rati of 1:2 so it works out o be 4% and 8% respectively). So equal to 1 cr and 2 cr respectively. Now profits are 30% on 1 cr + 24 % on 2 cr = 78 lakhs.

5. **Direction:** Study the following graph and pie chart carefully and answer the question given below,

Following bar graph represents monthly disribution of sales of cars of Naruti Fuzuki in the year 2018 and the pie chart
represents the overall percentage break up of sales of the different models of its cars in the whole year,
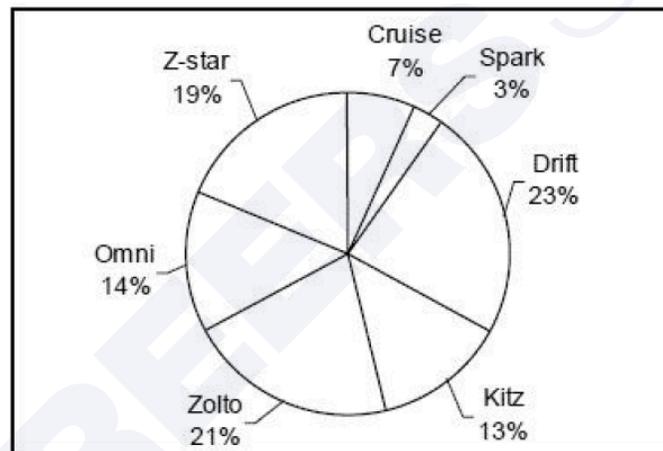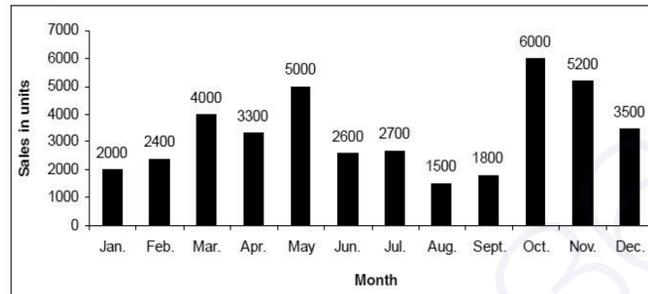
Q. If the sales of Naruti Fuzuki Drift was distributed equally across the four quarters of the year 2018, then what is the diffrence between the sales(in units) of the other six models in the fourth and the first quarter of two year?

A. 6300
B. 4300
C. 6100
D. 8400

SOLUTION

Total sale of Naruti Fuzuki Drift = 9200
sale in each quarter = 2300
Hence, the required difference is
$(6000 + 5200 + 3500 - 2300) - (2000 + 2400 + 4000 - 2300) = 6300\ units.$

6. **Direction:** Study the following graph and pie chart carefully and answer the question given below,

Following bar graph represents monthly disribution of sales of cars of Naruti Fuzuki in the year 2018 and the pie chart
represents the overall percentage break up of sales of the different models of its cars in the whole year,
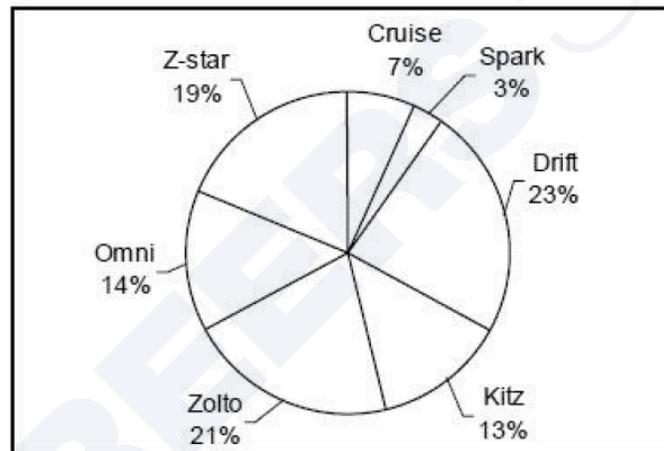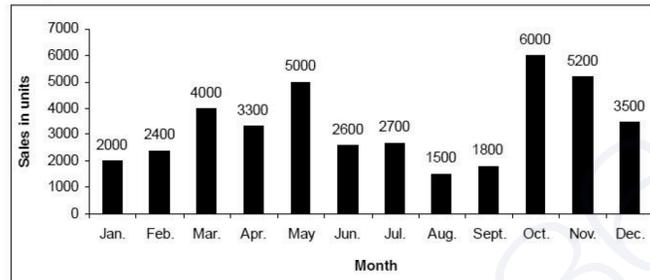
Q. If the manufacturing cost of a Naruti Fuzuki Cruise car is two times that of a Spark, then what will be the approximate percentage change in the total manufacturing cost of the two models if the percentage contribution of the sales of the two models are interchanged?

    A. 25%
    B. 24.54%
    C. 23.53%
    D. 25.62%

SOLUTION

Let the manufacturing cost of one Naruti Fuzuki Spark be Rs. x.

Total manufacturing cost of Spark = Rs.1200x

Total manufacturing cost of Cruise = Rs. 5600x

When percentage are interchanged:

Total manufacturing cost of Spark = Rs.2800x

Total manufacturing cost of Cruise = Rs.2400x

Percentage change in the total manufacturing cost

$$= \frac{6800x - 5200x}{6800x} \times 100 = 23 \cdot 53^0/_0.$$

7. **Direction:** Study the following graph and pie chart carefully and answer the question given below,

Following bar graph represents monthly disribution of sales of cars of Naruti Fuzuki in the year 2018 and the pie chart
represents the overall percentage break up of sales of the different models of its cars in the whole year,
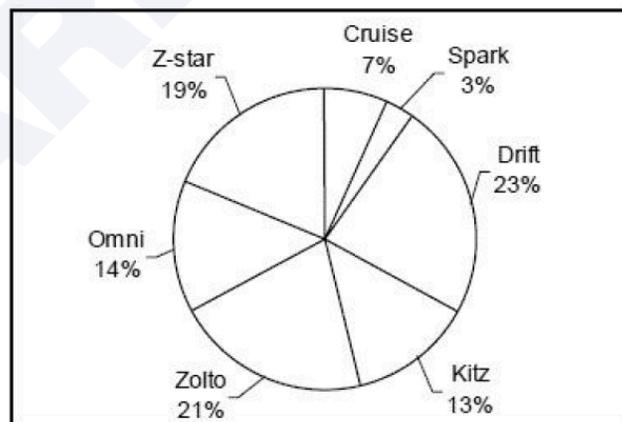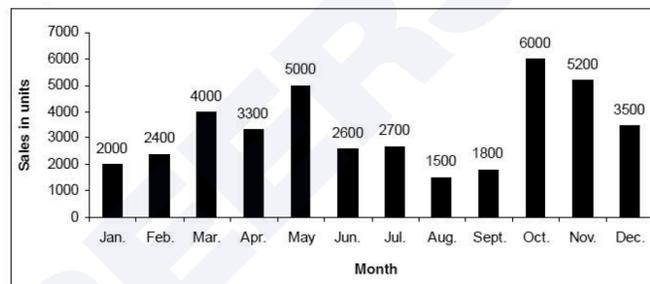
Q.In which month, the company experienced the maximum percentage increase in sales over the previous minth?

    A. March
    B. May
    C. November
    D. October

SOLUTION

The maximum percentage increase in sales over the prevoous month was experienced in the

month of October which was $\dfrac{6000 - 18000}{18000} = 233 \cdot 33\,{}^{0}/_{0}$

8. **Direction:** Study the following graph and pie chart carefully and answer the question given below,

Following bar graph represents monthly disribution of sales of cars of Naruti Fuzuki in the year 2018 and the pie chart
represents the overall percentage break up of sales of the different models of its cars in the whole year,
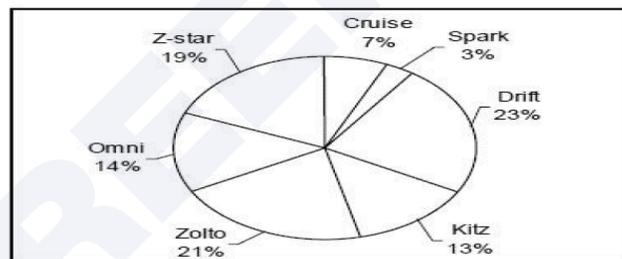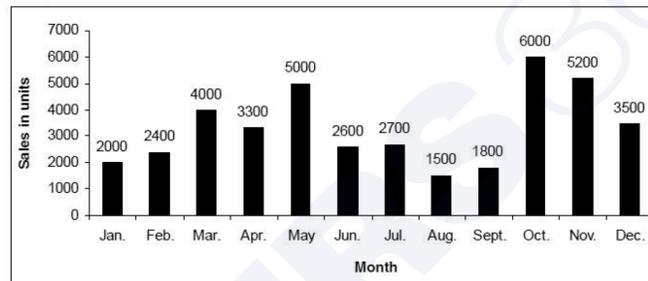
Q.If the total sales of Naruti Fuzuki Zolto is equally divided across the twelve months in the year 2018,what is the percentage sales of Zolto in the month of December over the total cars sold in December?

A. 25%
B. 22%
C. 20%
D. 16.66%

SOLUTION

Number of Zolto sold in the year 2018

$= \dfrac{21 \times 40 \cdot 000}{100} = 8400.$

Number of Zolto sold in the month of December

$$= \frac{84000}{12} = 700.$$

Percentage sales of Zolto over all the cars sold in

December $\quad = \dfrac{700 \times 100}{3500} = 20\,^0/_0$

9. **Direction:** Study the following graph and pie chart carefully and answer the question given below,

Following bar graph represents monthly disribution of sales of cars of Naruti Fuzuki in the year 2018 and the pie chart

represents the overall percentage break up of sales of the different models of its cars in the whole year,
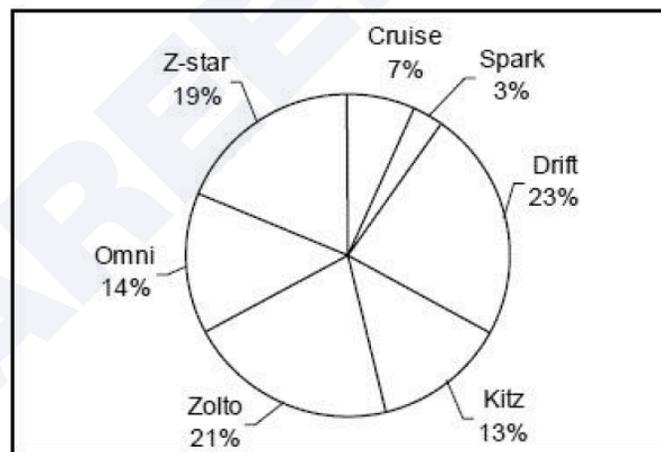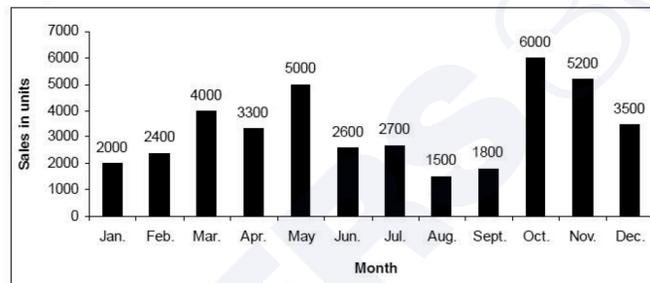
Q.If the profit earned by the company on the sale of one Naruti Fuzuki Kitz is Ts.50,000. What is the total profit earned by the company from the sale of Naruti Fuzuki Kitz in the year 2018?

    A. Rs.26 lakhs
    B. Rs. 26 crores
    C. Rs. 24 crores
    D. Rs. 24 lakhs

SOLUTION

Total profit earned from the sale of Kitz

$$= \frac{13 \times 40,000}{100} \times 50,000 = Rs.26\ crores$$

10. **DIRECTIONS:** Analyse the graph/s given below and answer the question that follows.

The following graph shows the ratio of imports to exports by two companies A and B over the years.
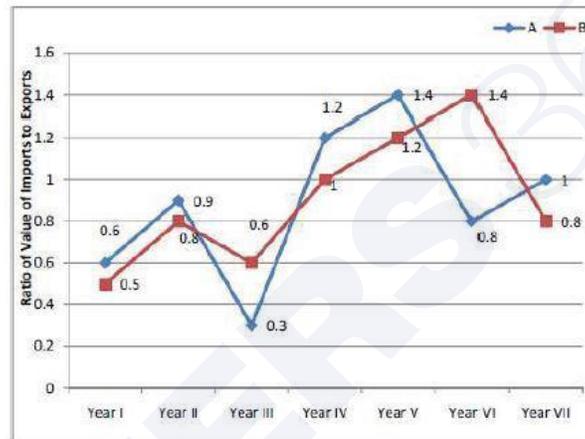
If the imports of company A in Year VI were Rs. 10.40 crore, what were the exports of company A in the same year?

    A. 13 crore
    B. 12.75 crore
    C. 12.50 crore
    D. None of these

SOLUTION

Correct Answer:- A
Explanation:-

Import/Export = 0.8 $\Rightarrow$ 10.4/Export = 0.8 $\Rightarrow$ Export = 13 cr.

PRACTICE QUESTIONS

1. **Direction:** Answer the questions on the basis of the information given below.

The table given below shows the number of international mathches (ODIs, test and T20s) played by india against five countries-Australia,England,Pakistan, Sri Lanka and South Africa-during the period-2007-2011, the line chart gives the average runs scored per inning by India against the given countries in the period 2007-2011

Year \ Country	Australia	England	Pakistan	Sri Lanka	South Africa
2007	7	9	11	14	10
2008	12	1	8	9	7
2009	6	5	5	4	9
2010	14	3	3	13	6
2011	3	13	1	3	12

Note: Each ODI and T20 cosists of one innings and each test consists of two innings.

Q1. What is the least number of total runs that would have been scored by India against England if it didn't play more than five Test matches against England?

A. 4700
B. 7890
C. 8927
D. 13400

Direction: Answer the questions on the basis of the information given below.

The table given below shows the number of international mathches (ODIs, test and T20s) played by india against five countries-Australia,England,Pakistan, Sri Lanka and South Africa-during the period-2007-2011, the line chart gives the average runs scored per inning by India against the given countries in the period 2007-2011

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2009	6	5	5	4	9
2010	14	3	3	13	6
2011	3	13	1	3	12

Note: Each ODI and T20 cosists of one innings and each test consists of two innings.

Q2, The number of India - Australia matches is appoximatly what percentage of India- Sri Lanka matches played in the period 2007-2011?

A. 101
B. 95
C. 96
D. 98

Direction: Answer the questions on the basis of the information given below.
The table given below shows the number of international mathches (ODIs, test and T20s) played by india against five countries-Australia,England,Pakistan, Sri Lanka and South Africa- during the period-2007-2011, the line chart gives the average runs scored per inning by India against the given countries in the period 2007-2011.

Country / Year	Australia	England	Pakistan	Sri Lanka	South Africa
2007	7	9	11	14	10
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2011	3	13	1	3	12
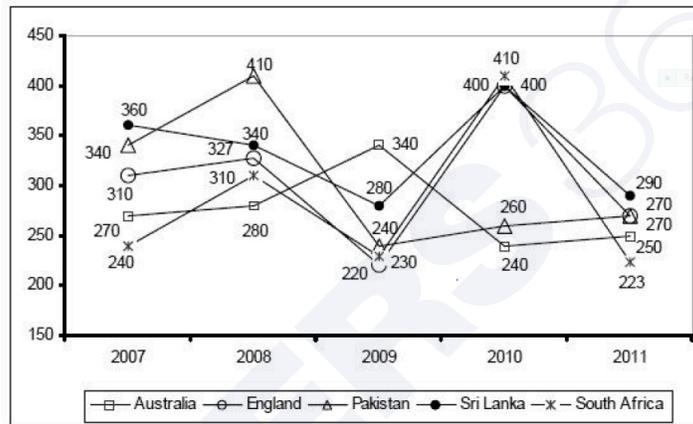
Note: Each ODI and T20 cosists of one innings and each test consists of two innings.

Q3. India played 3 and 2 Test matches against Pakistan in 2007 and 2008 respectively and no Test match took place between India and Pakistan from 2009 to 2011. Find the total runs scored by India against Pakistan in the period 2007-2011.

A. 10710
B. 8790
C. 11110
D. Cannot be determined

Direction: Answer the questions on the basis of the information given below.

The table given below shows the number of international mathches (ODIs, test and T20s) played by india against five countries-Australia,England,Pakistan, Sri Lanka and South Africa- during the period-2007-2011, the line chart gives the average runs scored per inning by India against the given countries in the period 2007-2011

Year \ Country	Australia	England	Pakistan	Sri Lanka	South Africa
2007	7	9	11	14	10
2008	12	1	8	9	7
2009	6	5	5	4	9
2010	14	3	3	13	6
2011	3	13	1	3	12

Note: Each ODI and T20 cosists of one innings and each test consists of two innings.

Q4.What is the total number of runs scored by india against South Africa in the period 2007-2011?

- A. 12740
- B. 16400
- C. 10670
- D. Cannot be determined

Direction: Answer the questions on the basis of the information given below.

The table given below shows the number of international mathches (ODIs, test and T20s) played by india against five countries-Australia,England,Pakistan, Sri Lanka and South Africa- during the period-2007-2011, the line chart gives the average runs scored per inning by India against the given countries in the period 2007-2011

Year \ Country	Australia	England	Pakistan	Sri Lanka	South Africa
2007	7	9	11	14	10
2008	12	1	8	9	7
2009	6	5	5	4	9
2010	14	3	3	13	6
2011	3	13	1	3	12

Note: Each ODI and T20 cosists of one innings and each test consists of two innings.

Q5. Against which of the following countries did india play the maximum number of international matches in the period 2007-2011?

- A. Australia
- B. Pakistan
- C. Sri Lanka
- D. South Africa

ANSWER KEY

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1 - C, 2 - D, 3 - C, 4 - D, 5 - D

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1. In order to minimize runs scored by India against England in the period 2007-2011, the number of Test matches played should be zero.

$\therefore$ Required runs $= 9 \times 310 + 5 \times 220 + 3 \times 400 + 13 \times 270 = 8927$

2. Rquired percentage $= \dfrac{42}{43} \times 100 = 98\,^0/_0$

3. Required number of runs

$= 14 \times 340 + 10 \times 410 + 5 \times 240 + 3 \times 260 + 1 \times 270 = 11110.$

4. We cannot calculate the number of runs scored by india against South Africa as we don't know the number of Test matches played between India and South Africa in the period of 2007-2011.

5. Number of matches played by india against the given teams in the period 2007-2011 are: Australia = 42, England = 31,Pakistan = 28, Sri Lanka = 43 and South Africa = 44.

DATA SUFFICIENCY

SOLVED EXAMPLES

. DIRECTIONS: The question below is followed by two statements marked I and II. Mark as your answer.

The area of a square is equal to that of a circle. What is the circumference of the circle?
I. The diagonal of the square is X inches.
II. The side of the square is Y inches.

    A. If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
    B. If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
    C. If the data either in statement I alone or in statement II alone are sufficient to answer the question.
    D. If the data even in both statements I and II together are not sufficient to answer the question.

SOLUTION

Correct Answer:- C

Explanation:-

Since we know that area of square = area of circle i.e. $a^2 = \pi r^2$ statement I gives the diagonal of the square, so we can determine the side of the square in terms of X and hence the circumference too in terms of X, so statement I is alone sufficient. Statement II gives us the side of the square. So we can find the circumference of the circle in terms of Y. Hence 3rd option.

2. **DIRECTIONS:** The question below is followed by two statements marked I and II. Mark as your answer.

What is the height of a right-angled triangle?
I. The area of the right-angled triangle is equal to the area of a rectangle whose breadth is 15 m.
II. The length of the rectangle is 12 m.

    A. If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.

B. If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
C. If the data either in statement I alone or in statement II alone are sufficient to answer the question.
D. If the data even in both statements I and II together are not sufficient to answer the question.

SOLUTION

Correct Answer:- D
Explanation:-

Statement I gives us that $\frac{1}{2} \times \text{Base} \times \text{height} = I \times 15$, so is not sufficient. Statement II gives L= 12 m, hence alone is not sufficient. Even on combining the two statements we cannot find the height as we do not know the base also. Hence option (4).

3. **DIRECTIONS:** The question below is followed by two statements marked I and II. Mark as your answer.

What is the difference between the shares of profits of Rekha and Nutan out of a profit of Rs. 6,000 at the end of the year?
I. Rekha invested Rs. 50, 000 and withdrew Rs. 1000 after 4 months.
II. For the last 8 months, Nutan's capital was 125% of Rekha's.

A. If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
B. If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
C. If the data either in statement I alone or in statement II alone are sufficient to answer the question.
D. If the data even in both statements I and II together are not sufficient to answer the question.

SOLUTION

Correct Answer:- D
Explanation:-
Statement I gives the investment of Rekha only, so alone is not sufficient. Statement II does not give complete information regarding the amount invested by Nutan, so alone is not sufficient. Even by combining, we do not know anything clearly about Nutan's investment for the whole year. Hence 4th option.

4. **DIRECTIONS:** The question below is followed by two statements marked I and II. Mark your answer.

What is the average daily wage of a worker who works for five days; he made Rs. 80 on the first, day.
I. The worker made a total of Rs. 400 for the first four days of work.
II. The worker made 20% more each day than he did on the previous day.

   A. If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
   B. If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
   C. If the data either in statement I alone or in statement II alone are sufficient to answer the question.
   D. If the data even in both statements I and II together are not sufficient to answer the question.

SOLUTION

Correct Answer:- B
Explanation:-
Statement I just tells us the total of Rs.400 for the first four days of the work, so the average daily wages of five days cannot be determined. Statement II states that the worker made 20 % more each day and we know that he earns Rs. 80 the first day, so we can calculate the wages for five days and hence the average. Hence statement II alone is sufficient to give the answer.

5. **DIRECTIONS:** The question below is followed by two statements marked I and II. Mark as your answer.

What is the cost of laying the carpet in a rectangular hall?

I. The cost of the carpet is Rs. 450 per square metre.
II. The perimeter of the hall is 50 meters.

   A. If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
   B. If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
   C. If the data either in statement I alone or in statement II alone are sufficient to answer the question.
   D. If the data even in both statements I and II together are not sufficient to answer the question.

SOLUTION

Correct Answer:- D
Explanation:-
Statement I gives the cost of the carpet only and no dimensions are known, so is not sufficient alone. Statement II gives us the perimeter of the hall but since the hall is a rectangle we still do not know the length and breadth of the room. So not sufficient. Even on combining, we do not know the dimensions of the room. Hence option (4).

6. **Direction:** The following question is followed by two statements, For answering the question, you have to decide whether any information provided in the statements is redundant or can be dispensed with while answering the given question,
Q. What is the circum-radius of a right-angled triangle?
I. The length of the hypotenuse of the right-angled triangle is 13 cm.
II. The perimeter of the right-angled triangle is 100 cm.

    A. if one of the statements is redundant.
    B. If both the statements are redundant.
    C. If one of the statements is redundant.
    D. If even by using both statements the answer can not be found.

SOLUTION

As we know circumradius of the right angle triangle is half of the hypotenuse, So statement II is redundant

7. **Direction:** In the following questions, a question is followed by two statements.
Q. What is the 4th term of a geometric progression?
I. the 3rd term of the geometric progression is 8,
II. The 7th term of the geometric progression is 128.

    A. If only one of the two statements is sufficient to answer the question.
    B. If either of.the two statements is sufficient to answer the question.
    C. If both the statements are required to answer the question.
    D. If the question cannot be answered even with the help of both the statement.

SOLUTION

From statement I alone and statement II alone we cannot answer the question. Even by using both the statement together, we cannot answer the question as there is no unique value.

$\because ar^6 = 128 \quad (i)$

and $\because ar^2 = 8 \quad (ii)$

Dividing equation (ii) by (i), we get

$r^2 = 16 \ or, r = \pm 2$

Thus, no unique value possible.

8. **Direction:** In the following questions, a question is followed by two statements.
Q. Three people A,B and C are standing along the border of a rectangular field X metres long and Y metres broad $(X, Y \ \epsilon \ N)$, What is the perimeter of the field?
I. The area of the field is 45 m²,
II. The shortest distance between A and B is equal to the shortest distance between B and C and also equals to the shortest distance between C and A, along the border.

  A. If only one of the two statements is sufficient to answer the question.
  B. If either of.the two statements are sufficient to answer the question.
  C. If both the statements are required to answer the question.
  D. If the question cannot be answered even with the help of both the statement.

From statement I alone we cannot answer the question as there are many pair to satisfy the given condition, From statement II alone we cannot answer the question as from the given information we cannot conclude anything, Even by using both the statements together we cannot answer the question.

SOLUTION

9. $\because A + B + C = Rs.4, 700.$
$\Rightarrow (c + 1200) + (c + 500) + c = 4700$
$\Rightarrow c = Rs.1,000$

From statement I alone we cannot answer the question as we don't know for what time money is invested. similarly, from statement II alone we cannot answer the question as we don't know the total profit to be shown. But using both the statements together we can answer the question.

9. **Direction:** In the following questions, a question is followed by two statements.
Q. Three men A, B and C invest Rs.4,700 for a business. A invests Rs. 700 more than B and B invests Rs.500 more than C. C invests for 14 months. How much profit will A receive?
I. Total profit at the end of the year is Rs. 840,**II.** A,B subscribe their money in a business for 8 and 9 months respectively,

  A. If only one of the two statements is sufficient to answer the question.
  B. If either of . the two statements are sufficient to answer the question.
  C. If both the statements are required to answer the question.
  D. If the question cannot be answered even with the help of both the statement.

SOLUTION

CP of mixture $= \dfrac{14}{1 \cdot 1} = Rs.12 \cdot 72/L$

From statement I alone or statement II alone cannot answer the question.
using both statements together we can answer the question.

∴ CP of pure juice $= \dfrac{18}{12} = Rs.15/L$

and CP of adulterated juice $= \dfrac{15}{1 \cdot 25} = Rs \cdot 12/L$

Now, using allegation we can answer the question.

10. **Direction:** In the following questions, a question is followed by two statements.
Q. In What ratio should pure and adulterated fruit juices be sold so as to make a profit of 10% by selling the mixture at Rs.14/litre?
I. Pure juice is sold at Rs. 18 per litre to get a profit of 20%.
II. Adulterated juice is sold at Rs.15 per litre to get a profit of 25%.

    A. If only one of the two statements is sufficient to answer the question.
    B. If either of . the two statements are sufficient to answer the question.
    C. If both the statements are required to answer the question.
    D. If the question cannot be answered even with the help of both the statement.

SOLUTION

Column A: Cost Price $= 250 \times \dfrac{100}{200} = \dfrac{1250}{6} = Rs.208 \cdot 30$

Column B: Cost price $= 300 \times \dfrac{100}{140} = \dfrac{1500}{7} = Rs.214 \cdot 20$

∵ B > A. Hence answer is 'a'.

11. Question: In which year was Amal born ?

Statements:

I. Amal at present is 35 years younger to his father.
II. Amal's brother, who was born in 1950, is 45 years younger to his father.

A. If data in the statement I alone is sufficient to answer the question.

B. If data in the statement II alone is sufficient to answer the question.

C If data either in the statement I alone or statement II alone are sufficient to answer the question.

D. If data in both statements I and II together are necessary to answer the question.

SOLUTION

Option D is the right answer

From both I and II, we find that Amal is (45 - 35) = 10 years older than his brother, who was born in 1950. So, Amal was born in 1940.

12. Question: What will be the total weight of 15 chairs, each of the same weight?

Statements:

I. One-third of the weight of each chair is 6 kg.
II. The total weight of five chairs is 30 kilograms more than the total weight of three chairs.

A. If data in the statement I alone is sufficient to answer the question.

B. If data in the statement II alone is sufficient to answer the question.

C If data either in the statement I alone or statement II alone are sufficient to answer the question.

D. If data in both statements I and II together are necessary to answer the question.

SOLUTION

Option C is the right answer

From I, we conclude that weight of each chair = (3 x 6) kg = 18 kg.

So, total weight of 15 chairs = (18 x 15) kg = 270 kg.

From II, we conclude that:

Weight of each chair = (weight of 5 chairs) - (weight of 3 chairs) = 30 kg.

So, total weight of 15 chairs = (30 x 15) kg = 450 kg.

13. Question : In a certain code language, '682' means 'zipper shirt pocket'. Which number means 'pocket' in that language ?

Statements :

I. In that language, '264' means 'shirt with pocket'.
II. In that language, '761' means 'button and pocket'.

 A. If data in the statement I alone is sufficient to answer the question.

 B. If data in the statement II alone is sufficient to answer the question.

 C If data either in the statement I alone or statement II alone are sufficient to answer the question.

 D. If data in both statements I and II together are necessary to answer the question.

SOLUTION

Option D is the right answer

In the given statement and I, the common words are 'shirt' and 'pocket' and the common codes are '6' and '4'. So, '6' and '4' are the codes for 'shirt' and 'pocket'.. In the given statement and II, the common code word '6' represents the common word 'pocket'.

14. Question : In a certain code, 'qrs tyu vwz' means 'She enjoys gardening'. Which code word means 'gardening'?

Statements :

I. 'mno jkl vwz'means 'He likes gardening'.
II. 'hij def tyu' means 'They enjoy swimming'.

 A. If data in the statement I alone is sufficient to answer the question.

 B. If data in the statement II alone is sufficient to answer the question.

 C If data either in the statement I alone or statement II alone are sufficient to answer the question.

 D. If data in both statements I and II together are necessary to answer the question.

SOLUTION

Option A is the right answer

In the given statement and I, the common word is 'gardening' and the common code word is vwz. So, vwzis the code for 'gardening'. Thus, in the given statement, 'vwz' is the code for 'gardening'.

15. . Question : In a row of five children X, Y, Z, W, and V, who is standing in the middle ?

Statements :

I. W is to the immediate right of V and Y is to the immediate left of V.

II. Y is at the extreme left of the row.

A. If data in the statement I alone is sufficient to answer the question.

B. If data in the statement II alone is sufficient to answer the question.

C If data either in the statement I alone or statement II alone are sufficient to answer the question.

D. If data in both statements I and II together are necessary to answer the question.

SOLUTION

Option D is the right answer

From I, we have the order: Y, V, W.

From II, Y is at the extreme left of the row.

Thus, considering both I and II, we conclude that among the five children, V is the third and hence the middle child in the row.

PRACTICE QUESTIONS

1. . Question : How many employees of Company Z opted for VRS ?

Statements :

I. 22% of the 800 executive cadre employees and 10% of the 1200 non-executive cadre employees opted for VRS.

II. 30% of the employees in the age-group of 55 to 60 and 15% of the employees in all other age-groups opted for VRS.

 A. If data in the statement I alone is sufficient to answer the question.

 B. If data in the statement II alone is sufficient to answer the question.

 C If data either in the statement I alone or statement II alone are sufficient to answer the question.

 D. If data in both statements I and II together are necessary to answer the question.

2. Question : What is Raj's rank from the top in a class of 30 students ?

Statements :

I. Raj ranks four ranks above Sameer who ranks 20th from the bottom.

II. Raj's rank from the top is three ranks below Priya who ranks 27th from the bottom

 A. If data in the statement I alone is sufficient to answer the question.

 B. If data in the statement II alone is sufficient to answer the question.

 C If data either in the statement I alone or statement II alone are sufficient to answer the question.

 D. If data in both statements I and II together are necessary to answer the question.

3. Question: It is 8.00 p.m., when can Sameer get the next bus for Suryanagar from Jamnagar?

Statements:

I. Buses for Suryanagar leave after every 45 minutes, till 11 p.m.

II. Thirty minutes ago, one bus has left for Suryanagar.

 A. If data in the statement I alone is sufficient to answer the question.

 B. If data in the statement II alone is sufficient to answer the question.

 C If data either in the statement I alone or statement II alone are sufficient to answer the question.

 D. If data in both statements I and II together are necessary to answer the question.

4. Question: What is the colour of the ripe banana?

Statements:

I. Red is called green, blue is called yellow, yellow is called orange.

II. Orange is called brown, brown is called white, green is called black, and black is called purple.

 A. If data in the statement I alone is sufficient to answer the question.

 B. If data in the statement II alone is sufficient to answer the question.

 C If data either in the statement I alone or statement II alone are sufficient to answer the question.

 D. If data in both statements I and II together are necessary to answer the question.

5. Question: On which day of the week did Nikhil visit the museum?

Statements:

I. Nikhil did not visit the museum either on Wednesday or on Friday.

II. Nikhil visited the museum two days before his father arrived at his house, which was the day after Thursday.

ANSWER KEY

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1 - A, 2 - C, 3 - D, 4 - A, 5 - B

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SOLUTIONS

1. Option A is the right answer

From I, we have: number of employees who opted for VRS = 22% of 800 + 10% of 1200 = 176 + 120 = 296.

From II, we cannot get the required answer until and unless the number of employees in age-group 55 to 60 and other age-groups is known.

2. Option C is the right answer

From I, We know that in a class of 30 students, Sameer ranks 20th from the bottom and 11th from the top.

Raj is four ranks above Sameer and so, Raj ranks 7th from the top.

From II, Priya ranks 27th from the bottom and hence, 4th from the top. Raj, being 3 ranks below Priya, is, thus, 7th from the top.

3. Option D is the right answer

From statement I alone, we know that buses leave for Suryanagar after every 45 minutes until 11 p.m. Since it's currently 8:00 p.m., and a bus left 30 minutes ago, the last bus departed at 7.30 PM. From I we can understand there is a bus after every 45 minutes indicating the next bus to come at 8.45 PM. Therefore, both the information are necessary.

4. Option A is the right answer

The color of the ripe banana is 'yellow'. From statement I, we know that 'yellow' is called 'orange'. Thus, the colour of the ripe banana is 'orange'.

5. Option B is the right answer

According to statement I, Nikhil visited the museum on any of the weekdays except Wednesday and Friday.

According to statement II, Nikhil's father arrived at his house on Friday, so Nikhil visited the museum two days before Friday, which is Wednesday.

SETS AND VENN DIAGRAMS

Venn Diagrams are a graphical tool used in data interpretation to visualize the relationships between different sets or categories of data. They are particularly useful for understanding overlapping or shared elements between various data groups.

Key Concepts in Venn Diagrams:

- Sets: Venn Diagrams represent different sets of data, where each set corresponds to a category or group.
- Overlapping Regions: The overlapping regions in a Venn Diagram represent elements that belong to multiple sets simultaneously.

Interpreting Venn Diagrams:

- Venn Diagrams scenarios require you to analyze the diagram to extract information about the relationships between sets, identify shared elements, and answer questions related to the data.

Example Venn Diagram:

Let's explore a detailed example of a Venn Diagram scenario to illustrate these concepts:

Scenario: Consider a Venn Diagram representing two sets: Set A and Set B.

Data Interpretation Questions:

- Identify the elements in Set A.
- Identify the elements in Set B.
- Determine the elements that belong to both Set A and Set B.
- Calculate the total number of elements in both Set A and Set B.

Answers:

- The elements in Set A are {1, 2, 3, 4, 5}.
- The elements in Set B are {3, 4, 5, 6, 7}.
- The elements that belong to both Set A and Set B are {3, 4, 5}.
- The total number of elements in both Set A and Set B is 5.

Conclusion: Venn Diagrams are a powerful visual tool for understanding the relationships between different sets of data. They help you identify shared elements and calculate various set-related parameters. Proficiency in interpreting Venn Diagrams is essential for analyzing complex data scenarios and extracting meaningful insights from overlapping data categories.

SOLVED EXAMPLES

1. In a group of 50 students, 25 play Hockey, 30 play Football, and 8 play no games. What is the number of students who play both Hockey and Football?

    A. 10
    B. 11
    C. 12
    D. 13

SOLUTION

Given:
Total number of students = 50
Number of students who play hockey = 25
Number of students who play football = 30
Number of students who play neither sport = 8

Let the number of students that participate in both football and hockey = a.
⇒ 50 = 25 + 30 – a + 8
⇒ 50 = 55 – a + 8
⇒ a = 55 + 8 – 50
⇒ a = 63 – 50 = 13

So, 13 students play both football and hockey. Hence, the **fourth option** is correct.

2. In a group of 15 people, 7 read German, 8 read Spanish, while 3 of them read none of these two. Find how many of them read both German and Spanish.

    A. 1
    B. 2
    C. 3
    D. 5

SOLUTION

Given:
Total number of people = 15
Number of persons who read Spanish = 8
Number of persons who read German = 7
Number of persons who read neither German nor Spanish = 3

⇒ Total number of people = Number of people who read German + Number of people who read Spanish – Number of people who read both + Number of people who read neither German nor Spanish

⇒ 15 = 7 + 8 – Number of people who read both + 3

⇒ Number of people who read both = 7 + 8 – 15 + 3

⇒ Number of people who read both = 18 – 15

⇒ Number of people who read both = 3

So, only 3 persons read both German and Spanish. Hence, the **third option** is correct.

3. 14 notebooks of a class were corrected with ink pen while 22 notebooks were corrected with colour pencil. If 4 notebooks were corrected with both, what is the strength of the class?

    A. 30
    B. 32
    C. 28
    D. 25

SOLUTION

Given:
Notebooks corrected with ink pen = 14
Notebooks corrected with colour pencil = 22
Notebooks corrected with both = 4

So, the total number of students in class = 14 + 22 – 4 = 32

Hence, the **second option** is correct.

4. In a group of 73 friends, 14 friends go to Gym and Karate classes both, whereas 7 friends neither go to Gym class nor to Karate class. If a total of 36 friends go to Gym class, then how many friends go to only Karate class?

    A. 30
    B. 32
    C. 44
    D. 23

SOLUTION

Given:
1. In a group of 73 friends, 14 friends go to Gym and Karate classes both.
2. 7 friends neither go to Gym class nor to Karate class.

3. A total of 36 friends go to Gym class.

We can solve this by using Venn diagram;

In the figure above, left circle shows friends going for gym only, right circle shows friends going for karate only;

The intersection part shows friends going to both gym and karate;

The outer part shows friends going neither gym nor karate;

According to statement 1, 14 will be placed in intersection part;

According to statement 3, 7 will be in outer area;

As total gym persons = 36;

So friends going to only gym = 36 - 14 = 22;

As we have total friends = 73;

So, friends going to only Karate = [73 - (22 + 14 + 7)

= 73 - 43;

30;

Hence, the first option is correct.

5. At the newborn baby boy Rahul's birthday party, 30 people wanted to shake hands with him and 20 people wanted to kiss him. 5 people opted to shake hands and kiss him at the same time. How many people attended the party?

A) 45
B) 55
C) 40
D) 35

Answer: Option (A)

Let the number of people who want to shake hands with the baby boy be s

The number of people who want to kiss the baby boy is k

Therefore, n(S) = 30

$\qquad$ n(K) = 20

The number of people who wanted to kiss him and shake his hands = n(S)∩n(SK)
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ = 5

The total number of people who attended the party = n(K ∪ S)
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ = n (K) +n (S) -n (S)∩ n(K)
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ = 30+20-5
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ = 50-5
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ = 45

Therefore, Option (A) is the right answer

6. All members of the FLO club take part in the dancing or singing. 150 people engage in the dancing, 140 in singing, and 80 in both. How many people are club members?

A) 200
B) 225
C) 250
D) 210

Let the number of people who are into singing be S

The number of people who are into dancing is D

Therefore, n(S) = 140

n(D) = 150

The number of people who are engaged in both singing and dancing = n(S) ∩ n(D)

= 80

The total number of people who are in the club = n(D ∪ S)

= n(D)+n(S)-n(S)∩n(D)
= 140+150-80
= 290-80
= 210

Therefore, Option (D) is the right answer

7. In Bangalore's Defence Colony, there are 25,000 residents. 14,000 of them subscribe to Sun TV Network, and 8,000 to Zion TV Network. How many people don't subscribe to either of the two if 4,000 subscribe to both?

A) 5,000
B) 6,000
C) 7,000
D) 8,000

Answer: Option (C)

Let the number of people who subscribe to Sun TV be S

The number of people who subscribe to Zion TV is Z

Therefore, n(S) = 14000

n(Z) = 8000

The number of people who subscribes to both= n(S)∩n(Z)

= 4000

The total number of subscribers = n(Z ∪ S)

= n(Z)+n(S)-n(S)∩n(Z)
= 14000+80000-4000
= 22000-4000
= 18000

Given the total number of people who live in the Colony = 25,000 = n(U)

The number of people who do not subscribe to both of the networks = $n(U)-n(Z \cup S)$

$$= 25{,}000 - 18{,}000$$

$$= 7{,}000$$

8. 50 monkeys went picnicking. 30 monkeys were selected to annoy goats, while 25 were selected to annoy bulls. How many decided to annoy both the animals?

A) 9
B) 5
C) 6
D) 7

Let the number of monkeys who want to disturb goats be G

The number of monkeys who wanted to disturb bulls is B

Therefore, $n(G) = 30$

$\quad\quad$ $n(B) = 25$

Let the number of monkeys who wanted to annoy both, $n(G) \cap n(B)$ be x

According to the question, the total number of monkeys = $n(G \cup B) = 50$

We know,
$n(G \cup B) = n(G) + n(B) - n(G \cup B)$

Substituting the above values, we get

$50 = 30 + 25 - x$
$50 = 55 - x$
$X = 5$
Therefore 5 monkeys decided to irritate both bulls as well as goats.

9. How many subsets would the set A ={1,4,5,7} contain?

A) 12
B) 16
C) 8
D) 24

Answer: Option (B)

The number of subsets of a set is given by the equation 2^n where n is the number of elements of the set

Here, n = 4

Therefore, the number of subsets of the set A ={1,4,5,7} is 2^4 = 16

10. 10 pupils signed up for both English and German in a class of 50 students. German has 20 enrolled. How many students signed up for only English and not German if the class's pupils were required to enroll in at least one of the two subjects?

A) 28
B) 40
C) 35
D) 30

Answer: Option (D)

Let the number of pupils who choose English by E

Let the number of pupils who choose German be G

Therefore, n(G) = 20

The number of pupils signed up for both English and German = n(E)∩n(G) = 10

The total number of enrolled students = n(E∪G) = 50

$$50 = n(E)+n(G)-n(E)∩n(G)$$
$$50 = n(E) + 20 - 10$$
$$50 = n(E)+10$$
$$N(E) = 40$$

Therefore the number of students who are enrolled in English is 40
The number of students who are enrolled in English only = n(E) - n(E)∩n(G)

$$= 40-10$$
$$= 30$$

11. 50% of the pupils in a class were enrolled in math, while 60% were enrolled in economics. What percent of the class didn't sign up for either of the two topics if 20% of the students took both math and economics?

A) 3%
B) 4%
C) 5%
D) 10%

Answer: Option (C)

Let us assume that there are 100 students in the class, then
Number of students who opted math = 50 = n(M)
Number of students who opted economics = 60 = n(E)
Number of students who opted for both = 20 = n(M)∩n(E)
The number of students who enrolled for at least one subject = n(M∪E)
n(M∪E) = n(M) + n(E) - n(M)∩n(E)
$$= 50 + 60 - 20$$
$$= 110 - 20$$
$$= 90$$
The number of students who did not enrol in any program = n(U) - n(M∪E)
$$= 100 - 90$$
$$= 10$$
This means that 5% of the students did not enrol in any program

12. Which of the following set is equivalent to set A = {a, b, c, d, e, f}?

A) B = {10, 5, 8, 21, 45, 78}
B) B = {c, a, b, f}
C) B = {-1, 0, 2, 4}
D) None of these

Answer: Option (A)

Equal sets are two sets that contain the same number of elements. Here both the sets {a,b,c,d,e,f} and {10,5,8,21,45,78} contain 6 elements and hence they are equivalent sets.

All other sets have 4 elements and hence they cannot be concluded as an equivalent set to {10,5,8,21,45,78}

13. Find the cardinality of the set {2, 4, 6, 8, 10, 13}?

A) 6
B) 10
C) 2
D) 3

Answer: Option (A)

The quantity of elements in a set is known as its cardinality. The set in this set consists of 6 elements: 2, 4, 6, 8 13, and 10.

14. If A = {1, 2, 3, 4,6} and B = {3, 4, 5, 6}, what is A ∩ B?

A) {1, 2, 5, 6}
B) {3, 4,6}
C) {1, 2, 3, 4, 5, 6}
D) {}

Answer: Option (B)

The items that are shared by both sets A and B are present in the intersection of the two sets, represented as A ∩ B in this case, and they are the numbers 3, 4 and 6.

15. In a classroom, there are 30 students. Out of these, 18 students like mathematics, 15 like science, and 10 like both subjects. How many students like exactly one subject?

A) 13
B) 23
C) 8
D) 12

Answer: Option (A)

Total number of students, n(U) = 30

Let the number of students who like Mathematics be m, N(m) = 18

Let the number of students who like Science be m, N(s) =15

Let the number of students who like both Mathematics and Science = N(m∩s) = 10.

The number of students who like Mathematics alone
 = number of students who like Mathematics - the number of students who like both Mathematics and Science

= 18 - 10
= 8

The number of students who like Science alone
 = number of students who like Science - the number of students who like both Mathematics and Science

=15 - 10
= 5

The number of students like exactly one subject = The number of students who like Mathematics one + The number of students who like Science alone

= 8 + 5
= 13

1. In a classroom, there are 30 students. Out of these, 18 students like mathematics, 15 like science, and 10 like both subjects. How many students like at least one subject?

A) 13
B) 23
C) 8
D) 12

2. In a classroom, there are 30 students. Out of these, 18 students like mathematics, 15 like science, and 10 like both subjects. How many students like do not like any subject?

A) 13
B) 23
C) 8
D) 7

3. In a library, there are 80 books on science, 50 books on literature, and 30 books that are both science and literature. How many books are there in total in the library?

A) 30
B) 50
C) 100
D) 130

4. In a survey, 100 people were asked about their favourite hobbies. 60 people liked reading, 50 liked swimming, and 40 liked painting.35 people also liked both reading and swimming, 20 people liked swimming and painting and 10 people liked reading and painting. How many people liked all three activities (reading, swimming, and painting)?

   A) 10
   B) 3
   C) 12
   D) 15

5. If A = {1, 2, 3, 4, 5} and B = {3, 4, 5, 6, 7}, what is the cardinality of A ∩ B?

A) 0
B) 3
C) 5
D) 2

ANSWER KEY

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1 - B, 2 - D, 3 - C, 4 - D, 5 - B

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SOLUTIONS

1. Answer: Option (B)

Total number of students, n(U) = 30

Let the number of students who like Mathematics be m, N(m) = 18

Let the number of students who like Science be m, N(s) =15

Let the number of students who like both Mathematics and Science = N(m∩s) = 10.

The number of students who like at least one subject = N(mUs)
$$= N(m) + N(s) - N(m∩s)$$
$$= 18 + 15 - 10$$
$$= 33 - 10$$
$$= 23$$

2. Answer: Option (D)

Total number of students, n(U) = 30

Let the number of students who like Mathematics be m, N(m) = 18

Let the number of students who like Science be m, N(s) =15

Let the number of students who like both Mathematics and Science = N(m∩s) = 10.

The number of students who do not like at least one subject = Total number of students - The number of students who like at least one subject

$$= n(U) - N(mUs)$$
$$= 30 - 23$$
$$= 7$$

3. Answer: Option (C)

Let the number of books in Science be s.

Let the number of books in literature be l.

Therefore

N(s) = 80

N(l) = 50

Number of books on both science and literature = N(s∩l) = 30

Then,

Total number of books in the library = N(s) + N(l) - N(s∩l)
$$= 80 + 50 - 30$$
$$= 130 - 30$$
$$= 100$$

4. Answer: Option (D)

Let the number of people who like reading be r

Let the number of people who like swimming be s

Let the number of people who like painting be p

So,
The number of people who like reading = N(r) = 60

The number of people who like swimming = N(s) = 50

The number of people who like painting = N(p) = 40

The number of people also liked both reading and swimming N(r∩s) = 35

The number of people liked swimming and painting N(p∩s) = 20

The number of people liked reading and painting N(p∩r) = 10

The total number of people = N(rUsUp)

$$= 100$$

We know that,

N(rUsUp) = N(r) + N(s) + N(p) - N(r∩s) - N(p∩s) - N(p∩r) + N(r∩s∩p)

Substituting the values, we get

100 = 60 + 50 + 40 - 35 - 20 - 10 + N(r∩s∩p)

100 = 150 - 65 + N(r∩s∩p)

100 = 15 + N(r∩s∩p)

 N(r∩s∩p) = 15

Therefore 15 people liked all three activities

5. A ∩ B = {3,4,5}

The cardinality of the intersection of sets A and B, denoted as A ∩ B, is the count of elements common to both sets, which is 3 in this case.

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