

Chapter - 3 Data Handling

Exercise

In Questions 1 to 16, there are four options, out of which only one is correct. Write the correct answer.

1. Let x, y, z be three observations. The mean of these observations is

- (a) $\frac{x \times y \times z}{3}$ (b) $\frac{x + y + z}{3}$ (c) $\frac{x - y - z}{3}$ (d) $\frac{x \times y + z}{3}$

Solution:-

- (b) $\frac{x + y + z}{3}$

The average or Arithmetic Mean or mean of a given data is given as sum of all observations by the Number of observations.

2. The number of trees in different parks of a city are 33, 38, 48, 33, 34, 34, 33 and 24. The mode of this data is

- (a) 24 (b) 34 (c) 33 (d) 48

Solution:-

- (c) 33

Mode is the observation that occurs most frequently in the data.

3. Which measures of central tendency get affected if the extreme observations on both the ends of a data arranged in descending order are removed?

- (a) Mean and mode (b) Mean and Median
(c) Mode and Median (d) Mean, Median and Mode

Solution:-

- (a) Mean and mode

4. The range of the data: 21, 6, 17, 18, 12, 8, 4, 13 is

- (a) 17 (b) 12 (c) 8 (d) 15

Solution:-

- (a) 17

The difference between the highest and lowest observations in a given data is called its Range.

$$\begin{aligned}\text{Range} &= \text{Highest} - \text{lowest} \\ &= 21 - 4 \\ &= 17\end{aligned}$$

5. The median of the data: 3, 4, 5, 6, 7, 3, 4 is
(a) 5 (b) 3 (c) 4 (d) 6

Solution:-

(c) 4

When the given data is arranged in ascending (or descending) order, then the middle most observation is the median of the data.

Arranging the given observation into ascending order 3, 3, 4, 4, 5, 6, 7
 So,
 4 is the middle most observation and it is the median of the data.

6. Out of 5 brands of chocolates in a shop, a boy has to purchase the brand which is most liked by children. What measure of central tendency would be most appropriate if the data is provided to him?
(a) Mean (b) Mode (c) Median (d) Any of the three

Solution:-

(b) Mode
 Mode is the observation that occurs most frequently in the data.

7. There are 2 aces in each of the given set of cards placed face down. From which set are you certain to pick the two aces in the first go?



Solution:

(c)
 In c, only two cards are placed face down, so, probability of picking up 2 aces in this is certain.

8. In the previous question, what is the probability of picking up an ace from set (d)?

- (a) $\frac{1}{6}$ (b) $\frac{2}{6}$ (c) $\frac{3}{6}$ (d) $\frac{4}{6}$

Solution:-

- (b) $\frac{2}{6}$

$$\text{Probability of picking up an ace from set} = \frac{\text{Number of ace in the set}}{\text{Total number of cards in the set}}$$

9. The difference between the highest and the lowest observations in a data is its

- (a) frequency (b) width (c) range (d) mode

Solution:-

- (c) Range

10. In a school, only 2 out of 5 students can participate in a quiz. What is the chance that a student picked at random makes it to the competition?

- (a) 20% (b) 40% (c) 50% (d) 30%

Solution:-

- (b) 40%

We have, in a school, only 2 out of 5 students can participate in a quiz.
So,

$$\text{Chance that a student picked at random} = \frac{2}{5}$$

$$\begin{aligned}\text{Then percentage} &= \frac{2}{5} \times 100 \\ &= 0.4 \times 100 \\ &= 40\%\end{aligned}$$

11. Some integers are marked on a board. What is the range of these integers?

- (a) 31 (b) 37 (c) 20 (d) 3

Solution:-

- (b) 37

The difference between the highest and lowest observations in a given data is called its Range.

Range = Highest – lowest

$$\begin{aligned} &= 20 - (-17) \\ &= 20 + 17 \\ &= 37 \end{aligned}$$

12. On tossing a coin, the outcome is

(a) only head (b) only tail (c) neither head nor tail (d) either head or tail

Solution:-

(d) either head or tail

13. The mean of three numbers is 40. All the three numbers are different natural numbers. If lowest is 19, what could be highest possible number of remaining two numbers?

(a) 81 (b) 40 (c) 100 (d) 71

Solution:-

(a) 81

We have,

The mean of three numbers is 40.

Lowest number = 19

Let us take the other two numbers be P, Q.

So,

$$\text{Mean} = \frac{P + Q + 19}{3}$$

$$40 = \frac{P + Q + 19}{3}$$

By cross multiplication we get,

$$120 = P + Q + 19$$

$$120 - 19 = P + Q$$

Then,

$$P + Q = 101$$

So,

$$81 + 20 = 101$$

Therefore, the highest number is 81

14. Khilona earned scores of 97, 73 and 88 respectively in her first three examinations. If she scored 80 in the fourth examination, then her average score will be

- (a) increased by 1 (b) increased by 1.5 (c) decreased by 1 (d) decreased by 1.5**

Solution:-

(d) decreased by 1.5

We have,

Khilona earned scores in 3 exams = 97, 73, 88

So,

$$\begin{aligned}\text{Mean} &= \frac{97 + 73 + 88}{3} \\ &= 86 \text{ marks}\end{aligned}$$

Khilona earned scores in 4 exam = 97, 73, 88, 80

So,

$$\begin{aligned}\text{Mean} &= \frac{97 + 73 + 88 + 80}{4} \\ &= 84.5 \text{ marks}\end{aligned}$$

Therefore, her average score will be $86 - 84.5 = 1.5$, decreased by 1.5

15. Which measure of central tendency best represents the data of the most popular politician after a debate?

- (a) Mean (b) Median (c) Mode (d) Any of the above**

Solution:-

(c) Mode

Mode is the observation that occurs most frequently in the data.

16. Which of the following has the same mean, median and mode?

- (a) 6, 2, 5, 4, 3, 4, 1 (b) 4, 2, 2, 1, 3, 2, 3 (c) 2, 3, 7, 3, 8, 3, 2 (d) 4, 3, 4, 3, 4, 6, 4**

Solution:-

(d) 4, 3, 4, 3, 4, 6, 4

$$\begin{aligned}\text{Mean of the given data} &= \frac{4 + 3 + 4 + 3 + 4 + 6 + 4}{7} \\ &= 4\end{aligned}$$

Mode is the observation that occurs most frequently in the data = 4.

When the given data is arranged in ascending (or descending) order, then the middle most observation is the median of the data.

Arranging the given data, 3, 3, 4, 4, 4, 4, 6.
So, the median is 4.

In Questions 17 to 31, fill in the blanks to make the statements true.

17. The difference between the highest and the lowest observations of a data is called _____.

Solution:-

The difference between the highest and the lowest observations of a data is called **Range**.

18. The mean of a data is defined as _____.

Solution:-

The average or Arithmetic Mean or mean of a given data is defined as **Sum of all observations by the Number of observations**.

19. In a set of observations, the observation that occurs the most often is called _____.

Solution:-

Mode

Mode is the observation that occurs most frequently in the data.

20. In a given data, arranged in ascending or descending order, the middle most observation is called _____.

Solution:-

Median.

When the given data is arranged in ascending (or descending) order, then the middle most observation is the median of the data.

21. Mean, Median, Mode are the measures of _____.

Solution:-

Central tendency

Mean, median and mode are the representative values of a group of observations. They are also called the measures of central tendency of the data.

22. The probability of an event which is certain to happen is _____.

Solution:-

The probability of an event which is certain to happen is 1.

23. The probability of an event which is impossible to happen is _____.

Solution:-

The probability of an event which is impossible to happen is 0.

24. When a die is thrown, the probability of getting a number less than 7 is _____.

Solution:-

When a die is thrown, the probability of getting a number less than 7 is 1.

Let us say that 1, 2, 3, 4, 5 and 6 are the possible outcomes when the die is thrown.

$$\begin{aligned}\text{Probability of getting a number less than 7} &= \frac{\text{Number less than 7}}{\text{number of sides in die}} \\ &= \frac{6}{6} \\ &= 1\end{aligned}$$

25. In throwing a die the number of possible outcomes is _____.

Solution:-

In throwing a die the number of possible outcomes is 6.

26. _____ can be used to compare two collections of data.

Solution:-

A double bar graph can be used to compare two collection of data.

27. The representation of data with bars of uniform width is called _____.

Solution:-

The representation of the data in the form of rectangles (bars) of uniform width is called a Bar Graph.

28. If the arithmetic mean of 8, 4, x, 6, 2, 7 is 5, then the value of x is _____.

Solution:-

If the arithmetic mean of 8, 4, x, 6, 2, 7 is 5, then the value of x is 3.

29. The median of any data lies between the _____ and _____ observations.

Solution:-

The median of any data lies between the minimum and maximum observations.

30. Median is one of the observations in the data if number of observations is _____.

Solution:-

Median is one of the observations in the data if number of observations is Odd.

31. Rohit collected the data regarding weights of students of his class and prepared the following table:

Weight (in kg)	44 – 47	48 – 51	52 – 55	56 – 60
Number of Students	3	5	25	7

A student is to be selected randomly from his class for some competition. The probability of selection of the student is highest whose weight is in the interval _____.

Solution:-

A student is to be selected randomly from his class for some competition.

The probability of selection of the student is highest whose weight is in the interval 52 – 55.

Because, more number of students comes under this interval.

In Questions 32 to 49, state whether the statements are True or False.

32. If a die is thrown, the probability of getting a number greater than 6 is 1.

Solution:-

False.

The possible outcomes when the die is thrown are 1, 2, 3, 4, 5 and 6.

33. When a coin is tossed, there are 2 possible outcomes.

Solution:-

True.

As coin can turn up either Head (H) or Tail (T).

34. If the extreme observations on both the ends of a data arranged in ascending order are removed, the median gets affected.

Solution:-

False.

When the given data is arranged in ascending (or descending) order, then the middle most observation is the median of the data.

So, if the extreme observations on both the ends of a data arranged in ascending order are removed, the median is not get affected.

35. The measures of central tendency may not lie between the maximum and minimum values of data.

Solution:-

False.

The measures of central tendency lies between the maximum and minimum values of data.

36. It is impossible to get a sum of 14 of the numbers on both dice when a pair of dice is thrown together.

Solution:-

True.

The possible outcomes when the die is thrown are 1, 2, 3, 4, 5 and 6.

So,

If both dice get 6, then sum of the number is 12.

37. The probability of the spinning arrow stopping in the shaded region (Fig. 3.4) is $\frac{1}{2}$.



Fig. 3.4

Solution:-

True.

Probability of spinning arrow stopping in the shaded region

$$\begin{aligned} &= \frac{\text{Number of shaded part in circle}}{\text{total number of parts}} \\ &= \frac{2}{4} \\ &= \frac{1}{2} \end{aligned}$$

38. A coin is tossed 15 times and the outcomes are recorded as follows : H T T H T H H H T T H T H T T. The chance of occurrence of a head is 50 per cent.

Solution:-

False.

$$\begin{aligned}
 \text{The chance of occurrence of a head} &= \frac{\text{occurrence of a head}}{\text{total number of trials}} \\
 &= \frac{7}{15} \times 100 \\
 &= 46.6 \%
 \end{aligned}$$

39. Mean, Median and Mode may be the same for some data.

Solution:-

True.

Let us consider the data 4, 3, 4, 3, 4, 6, 4

$$\begin{aligned}
 \text{Mean of the given data} &= \frac{4 + 3 + 4 + 3 + 4 + 6 + 4}{7} \\
 &= 4
 \end{aligned}$$

Mode is the observation that occurs most frequently in the data = 4.

When the given data is arranged in ascending (or descending) order, then the middle most observation is the median of the data.

Arranging the given data, 3, 3, 4, 4, 4, 4, and 6.

So, the median is 4.

40. The probability of getting an ace out of a deck of cards is greater than 1.

Solution:-

False.

The probability of getting an ace out of a deck of cards is less than 1.

41. Mean of the data is always from the given data.

Solution:-

False.

The average or Arithmetic Mean or mean of a given data is defined as Sum of all observations by the Number of observations.

42. Median of the data may or may not be from the given data.

Solution:-

True.

When the given data is arranged in ascending (or descending) order, then the middle most observation is the median of the data.

43. Mode of the data is always from the given data.

Solution:-

True.

Mode is the observation that occurs most frequently in the data.

44. Mean of the observations can be lesser than each of the observations.

Solution:-

False.

45. Mean can never be a fraction.

Solution:-

False.

46. Range of the data is always from the data.

Solution:-

False.

The difference between the highest and lowest observations in a given data is called its Range.

47. The data 12, 13, 14, 15, 16 has every observation as mode.

Solution:

True

Data is 12, 13, 14, 15, 16

As, every observation occurs one time.

Every observation can taken as mode.

48. The range of the data 2, -5, 4, 3, 7, 6 would change if 2 was subtracted from each value in the data.

Solution:

False

Data is 2, -5, 4, 3, 7, 6

Range = Highest value – Lowest value

$$= 7 - (-5)$$

$$= 7 + 5$$

$$= 12$$

After subtracting 2 from each value, data becomes 0, -7, 2, 1, 5, 4

Now, range = Highest value – Lowest value

$$= 5 - (-7)$$

$$= 5 + 7$$

$$= 12$$

Therefore, in both cases range is same.

49. The range of the data 3, 7, 1, -2, 2, 6, -3, -5 would change if 8 was added to each value in the data.

Solution:

False

Data is 3, 7, 1, -2, 2, 6, -3, and -5

Range = Highest value – Lowest value

$$= 7 - (-5)$$

$$= 12$$

After adding 8 to each value, data becomes 11, 15, 9, 6, 10, 14, 5, 3

Now,

Range = Highest value – Lowest value

$$= 15 - 3$$

$$= 12$$

Therefore, in both cases range is same.

50. Calculate the Mean, Median and Mode of the following data: 5, 10, 10, 12, 13. Are these three equal?

Solution:

Data is 5, 10, 10, 12, 13.

$$\text{Mean} = \frac{5, 10, 10, 12, 13}{5}$$

$$= 10$$

As, 10 occurs most frequently, two times.

Mode = 10

Observations are odd in number.

Median = Middle most observation = 3rd observation

So,

Median = 10

Mean = Median = Mode = 10

Yes, these three are equal.

51. Find the mean of the first ten even natural numbers.

Solution:

First ten even natural numbers = 2, 4, 6, 8, 10, 12, 14, 16, 18, 20.

Sum of all observations = $2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20$
 $= 110$

$$\begin{aligned} \text{Mean} &= \frac{110}{10} \\ &= 11 \end{aligned}$$

52. A data constitutes of heights (in cm) of 50 children. What do you understand by mode for the data?

Solution:

Mode is the observation that occurs most frequently in a set of observation.

Here,

Mode is the height that occurs most frequently in the set of heights of 50 children.

53. A car seller collects the following data of cars sold in his shop.

Colour of Car	Number of Cars Sold
Red	15
Black	20
White	17
Silver	12
Others	9

(a) Which colour of the car is most liked?

(b) Which measure of central tendency was used in (a)?

Solution:

- (a) Black colour of car is most liked because number of cars sold of black car is greatest.
(b) Mode is used in (a) part.

54. The marks in a subject for 12 students are as follows:

31, 37, 35, 38, 42, 23, 17, 18, 35, 25, 35, 29

For the given data, find the

(a) Range (b) Mean (c) Median (d) Mode

Solution:

Arranging the data in ascending order, we get,
17, 18, 23, 25, 29, 31, 35, 35, 35, 37, 38, 42

(a) Range = Highest value – Lowest value
= 42 – 17
= 25

(b)
$$\text{Mean} = \frac{17, 18, 23, 25, 29, 31, 35, 35, 35, 37, 38, 42}{12}$$

= 30.41

(c) Observations are even in number.
Median = Mean of two middle most observations
= $\frac{31+35}{2}$
= 33

(d) As, 35 occurs most frequently = 3 times.
Mode = 35.

55. The following are weights (in kg) of 12 people.

70, 62, 54, 57, 62, 84, 75, 59, 62, 65, 78, 60

(a) Find the mean of the weights of the people.

(b) How many people weigh above the mean weight?

(c) Find the range of the given data.

Solution:

(a) Rerranging the data in ascending order, we get
54, 57, 59, 60, 62, 62, 62, 65, 70, 75, 78, 84

$$\begin{aligned}\text{Mean} &= \frac{54, 57, 59, 60, 62, 62, 62, 65, 70, 75, 78, 84}{12} \\ &= 65.6\text{kg}\end{aligned}$$

(b) As, mean = 65.6 kg
4 people have weight above mean weight.

(c) Range = Highest weight – Lowest weight
= (84 – 54) kg
= 30 kg

56. Following cards are put facing down:

A E I O U

What is the chance of drawing out

(a) a vowel (c) a card marked U
(b) A or I (d) a consonant

Solution:

Total cards = 5

(a) Here, all cards are vowel.

Chance of drawing out a vowel is 1.

(b) Chance of drawing out a card marked A or I = $\frac{2}{5}$

(c) As, one card has marked U.

Chance of drawing out a card marked U is = $\frac{1}{5}$

(d) As, there is no consonant.

Chance of drawing out a consonant is 0.

57. For the given data given below, calculate the mean of its median and mode.

6, 2, 5, 4, 3, 4, 4, 2, 3

Solution:

Rearranging the data in a ascending order, we get

2, 2, 3, 3, 4, 4, 4, 5, 6

As, observations are odd,

Median = Middle most observation

= 4

Since, 4 occurs most frequently = 3 times

Mode = 4

Now, mean of median and mode is given by,

$$\begin{aligned}\text{Mean} &= \frac{\text{Median} + \text{Mode}}{2} \\ &= \frac{4 + 4}{2} \\ &= 4\end{aligned}$$

58. Find the median of the given data if the mean is 4.5.

5, 7, 7, 8, x, 5, 4, 3, 1, 2

Solution:

The data is 5, 7, 7, 8, x, 5, 4, 3, 1, 2

So,

Mean is given by,

$$\text{Mean} = \frac{5 + 7 + 7 + 8 + x + 5 + 4 + 3 + 1 + 2}{10}$$

$$4.5 = \frac{42 + x}{10}$$

$$45 = 42 + x$$

$$x = 3$$

Now, arranging the data in ascending order, we get

1, 2, 3, 3, 4, 5, 5, 7, 7, 8

As, observations are even in number.

Median = Mean of two middle most observations

$$\begin{aligned}&= \frac{4 + 5}{2} \\ &= 4.5\end{aligned}$$

59. What is the probability of the sun setting tomorrow?

Solution:

It is certain that sun setting every evening

So,

Probability of sun setting tomorrow is 1.

60. When a spinner with three colours (Fig. 3.5) is rotated, which colour has more chance to show up with arrow than the others?

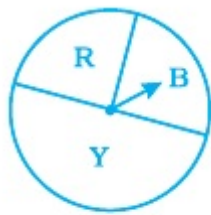


Fig. 3.5

Solution:

Colour Y has more chance to show up with arrow than the others because Y has more region than both colours B and R.

61. What is the probability that a student chosen at random out of 3 girls and 4 boys is a boy?

Solution:

Given,

Total number of students $3 + 4 = 7$

Total number of boys = 4

So,

Probability that the student chosen is a boy = $\frac{4}{7}$

62. The letters written on paper slips of the word MEDIAN are put in a bag. If one slip is drawn randomly, what is the probability that it bears the letter D?

Solution:

Total letters in the word MEDIAN = 6

D occurs only at once.

So,

Probability (Drawn slip bears the letter D) = $\frac{1}{6}$

63. Classify the following events as certain to happen, impossible to happen, may or may not happen:

(a) Getting a number less than 1 on throwing a die.

(b) Getting head when a coin is tossed.

(c) A team winning the match.

(d) Christmas will be on 25 December.

(e) Today moon will not revolve around the earth.

(f) A ball thrown up in the air will fall down after some time.

Solution:

- (a) Since, no number is less than 1 on a die.
Getting a number less than 1 on throwing a die is impossible to happen.
- (b) When a coin is tossed two outcomes are possible = Head or Tail.
Getting head when a coin is tossed may or may not happen.
- (c) A team winning the match may or may not happen because a team can lose the match.
- (d) Christmas will be on 25 December is certain to happen.
- (e) Since, moon always revolves around the earth.
Today moon will not revolve around the earth is impossible to happen.
- (f) A ball thrown up in the air will fall down after some time is certain to happen due to gravity of earth.

**64. A die was thrown 15 times and the outcomes recorded were
5, 3, 4, 1, 2, 6, 4, 2, 2, 3, 1, 5, 6, 1, 2
Find the mean, median and mode of the data.**

Solution:

Arranging the data in ascending order, we get
1, 1, 1, 2, 2, 2, 2, 3, 3, 4, 4, 5, 5, 6, 6

$$\begin{aligned} \text{Mean} &= \frac{1+1+1+2+2+2+2+3+3+4+4+5+5+6+6}{15} \\ &= 3.13 \end{aligned}$$

As, observations are odd in number,
Median = Middle most observation
= 8th observation
= 3

Since, 2 occurs most frequently = 4 times
So,
Mode = 2

65. Find the mean of first six multiples of 4.

Solution:

First six multiples of 4 are 4, 8, 12, 16, 20, and 24.

$$\begin{aligned} \text{Mean} &= \frac{4+8+12+16+20+24}{6} \\ &= 14 \end{aligned}$$

66. Find the median of first nine even natural numbers.

Solution:

First nine even natural numbers are
2, 4, 6, 8, 10, 12, 14, 16, 18

As, observations are odd in number.

Median = Middle most observation
= 5th observation
= 10

67. The mean of three numbers is 10. The mean of other four numbers is 12. Find the mean of all the numbers.

Solution:

Mean of 3 numbers = 10

Mean of 4 numbers = 12

$$\text{Mean} = \frac{\text{Sum of 3 observations}}{3}$$

$$10 = \frac{\text{Sum of 3 observations}}{3}$$

Sum of 3 observations = 30

Also,

.....(1)

$$\text{Mean} = \frac{\text{Sum of 4 observations}}{4}$$

$$12 = \frac{\text{Sum of 4 observations}}{4}$$

Sum of 4 observations = 48

..... (2)

From (1) and (2), we get

Sum of 7 observations = 30 + 48 = 78

$$\begin{aligned}\text{Required Mean} &= \frac{\text{Sum of 7 observations}}{7} \\ &= \frac{78}{7} \\ &= 11.14\end{aligned}$$

68. Find the mode of the given data:

10, 8, 4, 7, 8, 11, 15, 8, 4, 2, 3, 6, 8

Solution:

Rearranging the data in ascending order, we get

2, 3, 4, 4, 6, 7, 8, 8, 8, 8, 10, 11, 15

Since, 8 occurs most frequently in the data = 4 times.

Mode = 8

69. Given below are heights of 15 boys of a class measured in cm:

128, 144, 146, 143, 136, 142, 138, 129, 140, 152, 144, 140, 150, 142, 154.

Find

- (a) The height of the tallest boy.**
- (b) The height of the shortest boy.**
- (c) The range of the given data.**
- (d) The median height of the boys.**

Solution:

Rearranging the heights in ascending order, we get

128, 129, 136, 138, 140, 140, 142, 142, 143, 144, 144, 146, 150, 152, 154

(a) Height of the tallest boy is 154 cm.

(b) Height of the shortest boy is 128 cm.

(c) Range = Highest value – Lowest value
 $= (154 - 128) \text{ cm}$
 $= 26 \text{ cm}$

(d) As, observations are odd in number
 Median height = Middle most height
 $= 142 \text{ cm}$

70. Observe the data and answer the questions that follow:

16, 15, 16, 16, 8, 15, 17

(a) Which data value can be put in the data so that the mode remains the same?

(b) At least how many and which value(s) must be put in to change the mode to 15?

(c) What is the least number of data values that must be put in to change the mode to 17? Name them.

Solution:

Given data,
16,15,16,16,8,15,17

Rearranging the given data in ascending order, we have 8, 15, 15, 16, 16, 16, 17

(a) 16 is the mode of data, as it has highest frequency, = 3.

Now,

if 15 is added to the given data, mode will get changed to 15 and 16, whereas if any other number, 8,16 or 17 is added, mode will remain same.

(b) Atleast two 15's should be added to change the mode to 15.

On adding two 15's the frequency of 15 will be maximum = 4.

(c) We have to add atleast three 17's to change the mode to 17.

On adding three 17's, the frequency of 17 will be maximum = 4.

71. Age (in years) of 6 children of two groups are recorded as below:

Age (in Years)	
Group A	Group B
7	7
7	9
9	11
8	12
10	12
10	12

(a) Find the mode and range for each group.

(b) Find the range and mode if the two groups are combined together.

Solution:

From the given table,

Age of children in group A = 7 yr, 7 yr, 9 yr, 8 yr, 10 yr, 10 yr

Age of children in group B = 7 yr, 9 yr, 11 yr, 12 yr, 12 yr, 12 yr

(a) Mode in group A = 7 yr and 10 yr. [As, 7 yr and 10 yr occurs most frequent = 2times]

Range in group A = Maximum value – Minimum value

$$= 10 - 7$$

$$= 3$$

Mode in groups = 12 yr

[As 12yr is the most frequent = 3]

Range in group 8 = Maximum value – Minimum value

$$= 12 - 7$$

$$= 5$$

(b) If both groups are combined together 7, 7, 7, 9, 9, 11, 8, 12, 10, 12, 12.

Mode = 7 and 12

[As 7 and 12 occurs most frequent = 3 times]

So,

Range = Maximum value – Minimum value

$$= 12 - 7$$

$$= 5$$

72. Observe the given bar graph carefully and answer the questions that follow.

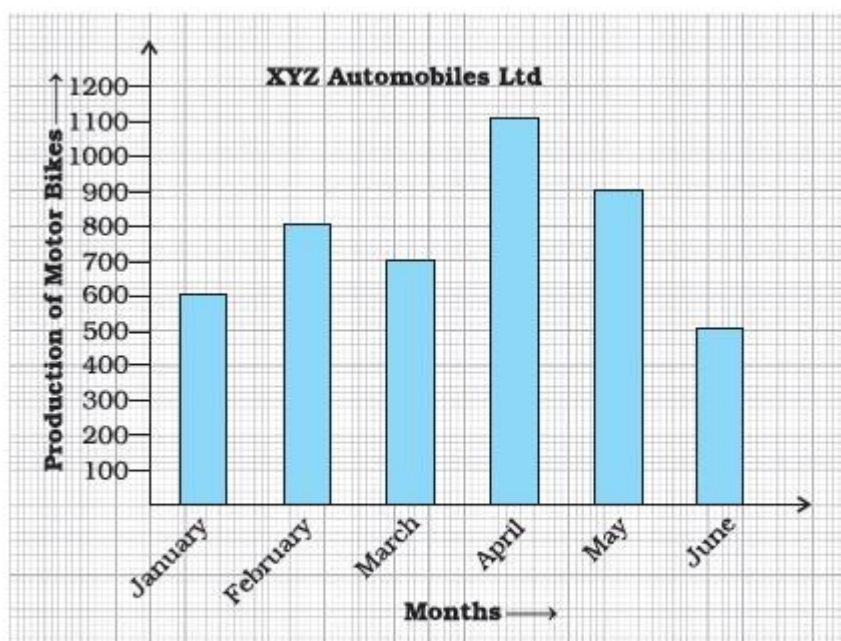


Fig. 3.6

a) What information does the bar graph depict?

(b) How many motor bikes were produced in the first three months?

(c) Calculate the increase in production in May over the production in January.

(d) In which month the production was minimum and what was it?

(e) Calculate the average (mean) production of bikes in 6 months.

Solution:

(a) The given bar graph shows the production of motor bikes by XYZ automobiles Ltd. during January to June.

(b) Total number of motor bikes produced in first three months = Motor bikes produced in January + Motor bikes produced in February + Motor bikes produced in March
 $= 600 + 800 + 700$
 $= 2100$

(c) Increase in production in May over the production in January = Production in May – Production in January
 $= 900 - 600$
 $= 300$

(d) Observing the graph, we can say that the production was minimum in the month of June = 500.

(e) Average Production = $\frac{\text{Sum of production in every month}}{\text{Number of months}}$
 $= \frac{600 + 800 + 700 + 1100 + 900 + 500}{6}$
 $= \frac{4600}{6}$
 $= 766.66$

73. The bar graph given below shows the marks of students of a class in a particular subject:

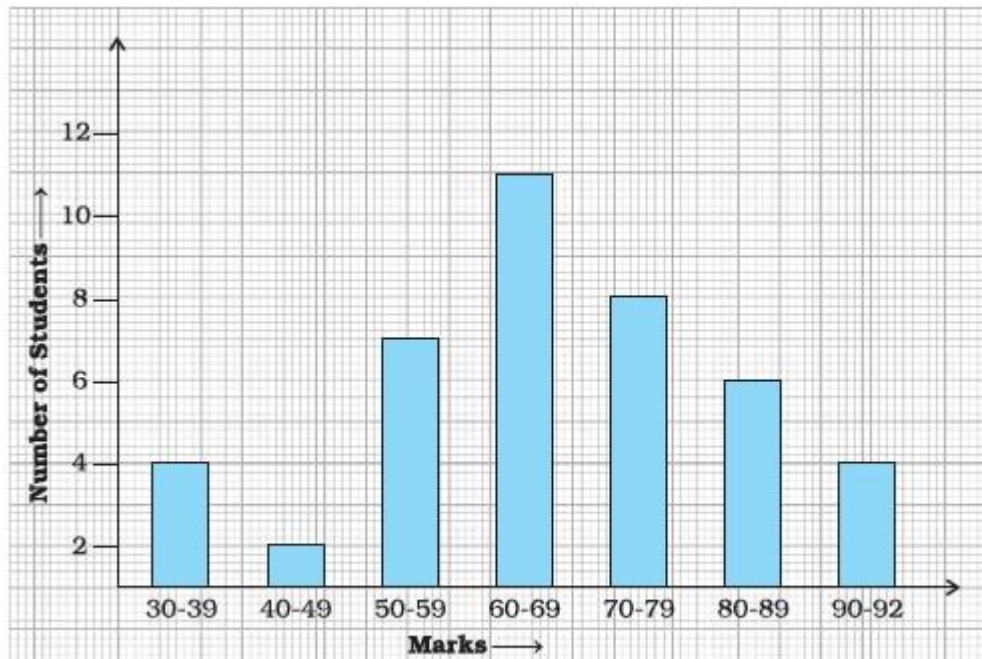


Fig. 3.7

Study the bar graph and answer the following questions:

- (a) If 40 is the pass mark, then how many students have failed?**
- (b) How many students got marks from 50 to 69?**
- (c) How many students scored 90 marks and above?**
- (d) If students who scored marks above 80 are given merits then how many merit holders are there?**
- (e) What is the strength of the class?**

Solution:

(a) Number of students scored marks below 40,
In 30-39 are 4 .
4 students have failed.

(b) Number of students got marks from 50 to 59 is 7 and number of students got marks from 60 to 69 is 11.
So, $7 + 11 = 18$ students got marks from 50 to 69.

(c) 4 students scored marks from 90 and above.

(d) Number of students got marks from 80 to 89 is 6.
Number of students got marks from 90 to 92 is 4.
So,
 $6 + 4 = 10$ students are merit holders.

(e) Total number of students in the class $= 4 + 2 + 7 + 11 + 8 + 6 + 4$
 $= 42$

74. Study the bar graph given below and answer the questions that follow.

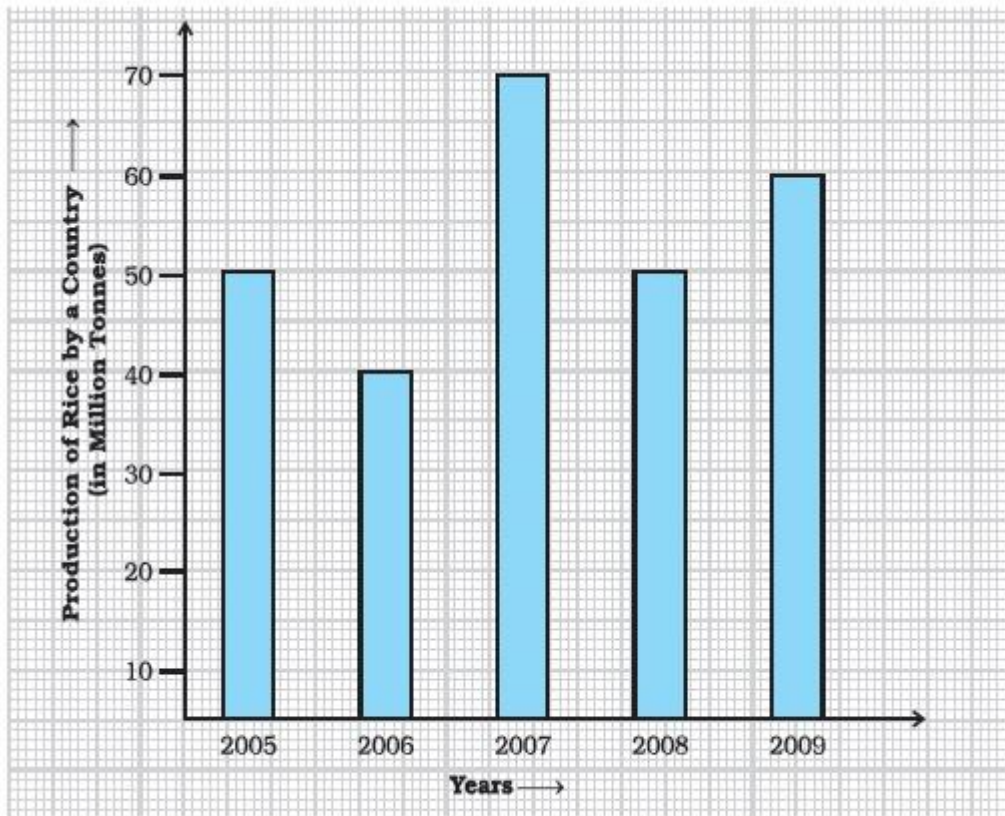


Fig. 3.8

- (a) What information does the above bar graph represent?
- (b) In which year was production the least?
- (c) After which year was the maximum rise in the production?
- (d) Find the average production of rice during the 5 years.
- (e) Find difference of rice production between years 2006 and 2008.

Solution:

After studying the bar graph, we have

Production of rice in 2005 = 50 million tonne

Production of rice in 2006 = 40 million tonne

Production of rice in 2007 = 70 million tonne

Production of rice in 2008 = 50 million tonne

Production of rice in 2009 = 60 million tonne

(a) The bar graph shows the production of rice in million tonne by a country during years 2005 to 2009.

(b) The production of rice was the least in 2006 = 40 million tonne.

(c) The maximum production of rice was in 2007.
The production rose after 2006.

$$\begin{aligned}
 (d) \text{Average Production} &= \frac{\text{Sum of production in every month}}{\text{Number of months}} \\
 &= \frac{50 + 40 + 70 + 50 + 60}{5} \\
 &= \frac{270}{5} \\
 &= 54 \text{ million tonnes}
 \end{aligned}$$

- (e) Rice production in 2006 = 40 million tonnes
 Rice production in 2008 = 50 million tonnes
 Difference = 50 – 40
 = 10 million tonne.

75. Study the bar graph given below and answer the questions that follow :

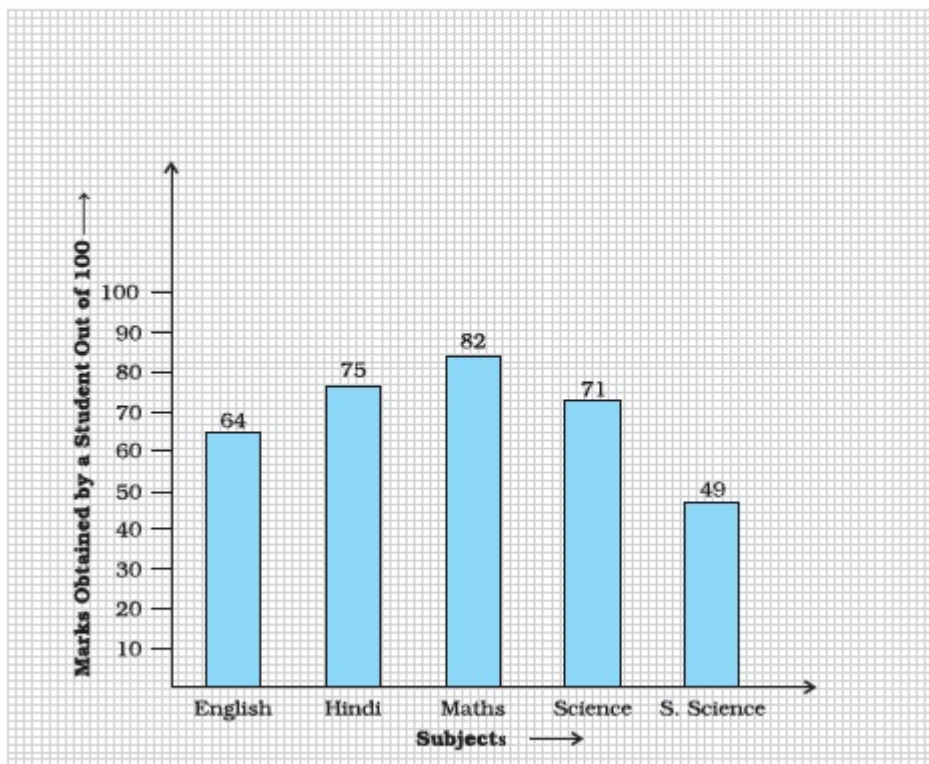


Fig. 3.9

- What information is depicted from the bar graph?
- In which subject is the student very good?
- Calculate the average marks of the student.
- If 75 and above marks denote a distinction, then name the subjects in which the student got distinction.
- Calculate the percentage of marks the student got out of 500.

Solution:

(a) The bar graph depicts the information about marks obtained by a student in 5 different subjects.

(b) As the student get highest marks in Maths = 82
So, The student is very good in Maths.

$$\begin{aligned}\text{(c) Average Production} &= \frac{\text{Sum of production in every month}}{\text{Number of months}} \\ &= \frac{64 + 75 + 82 + 71 + 49}{5} \\ &= \frac{341}{5} \\ &= 68.2\end{aligned}$$

(d) The student got 75 marks in Hindi and 82 marks in Maths.
In Hindi and Maths, the student got distinction.

(e) Total marks obtained by the student = $64 + 75 + 82 + 71 + 49$
= 341

$$\begin{aligned}\text{Percentage marks} &= \frac{341}{500} \times 100 \\ &= 68.2 \%\end{aligned}$$

76. The bar graph given below represents the circulation of newspapers (dailies) in a town in six languages (the figures are approximated to hundreds).

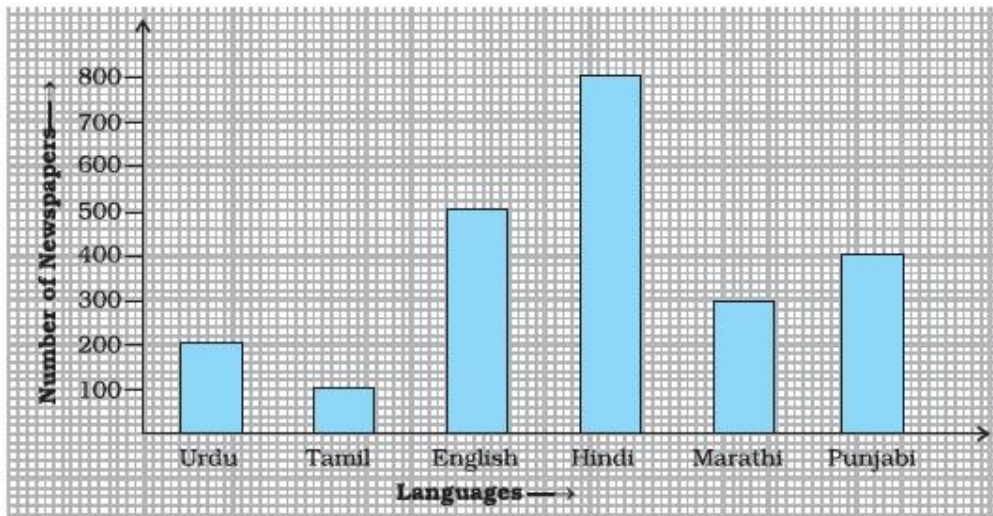


Fig. 3.10

Study the bar graph and answer the following questions:

- Find the total number of newspapers read in Hindi, Punjabi, Urdu, Marathi and Tamil.
- Find the excess number of newspapers read in Hindi than those in English.
- Name the language in which the least number of newspapers are read.
- Write the total circulation of newspapers in the town.

Solution:

- Total number of newspapers read in Hindi, Punjabi, Urdu, Marathi and Tamil

$$= 800 + 400 + 200 + 300 + 100$$

$$= 1800$$

- Number of newspapers read in Hindi = 800
 Number of newspapers read in English = 500
 So,
 $800 - 500 = 300$ excess newspapers read in Hindi than in English.

- The least number of newspapers are read in Tamil language.

- Total number of newspapers in the town = $200 + 100 + 500 + 800 + 300 + 400$

$$= 2300$$

77. Study the double bar graphs given below and answer the following questions:

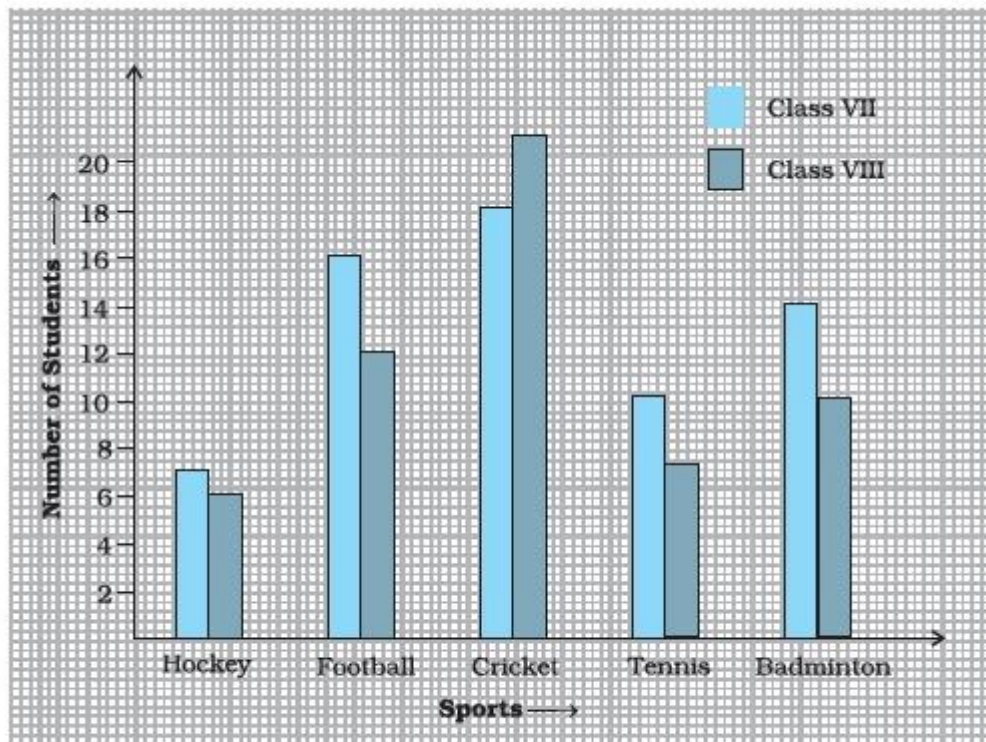


Fig. 3.11

- Which sport is liked the most by Class VIII students?
- How many students of Class VII like Hockey and Tennis in all?
- How many students are there in Class VII?
- For which sport is the number of students of Class VII less than that of Class VIII?
- For how many sports students of Class VIII are less than Class VII?
- Find the ratio of students who like Badminton in Class VII to students who like Tennis in Class VIII.

Solution:

- Cricket has highest value for Class VIII students in the graph.
Cricket is liked the most by Class VIII students.
- Number of students like Hockey of Class VII = 7
Number of students like Tennis of Class VII = 10
So,
 $7 + 10 = 17$ students of Class VII like Hockey and Tennis.
- Total number of students in Class VII = $7 + 16 + 18 + 10 + 14$
 $= 65$
- For Cricket only, the number of students of Class VII is less than that of Class VIII.

(e) For Hockey Football, Tennis and Badminton or in 4 sports, students of Class VIII are less than that of Class VII.

(f) Number of students like Badminton in Class VII = 14
Number of students like Tennis in Class VIII = 7

$$\begin{aligned}\text{Required ratio} &= \frac{14}{7} \\ &= 2:1\end{aligned}$$

78. Study the double bar graph shown below and answer the questions that follow:

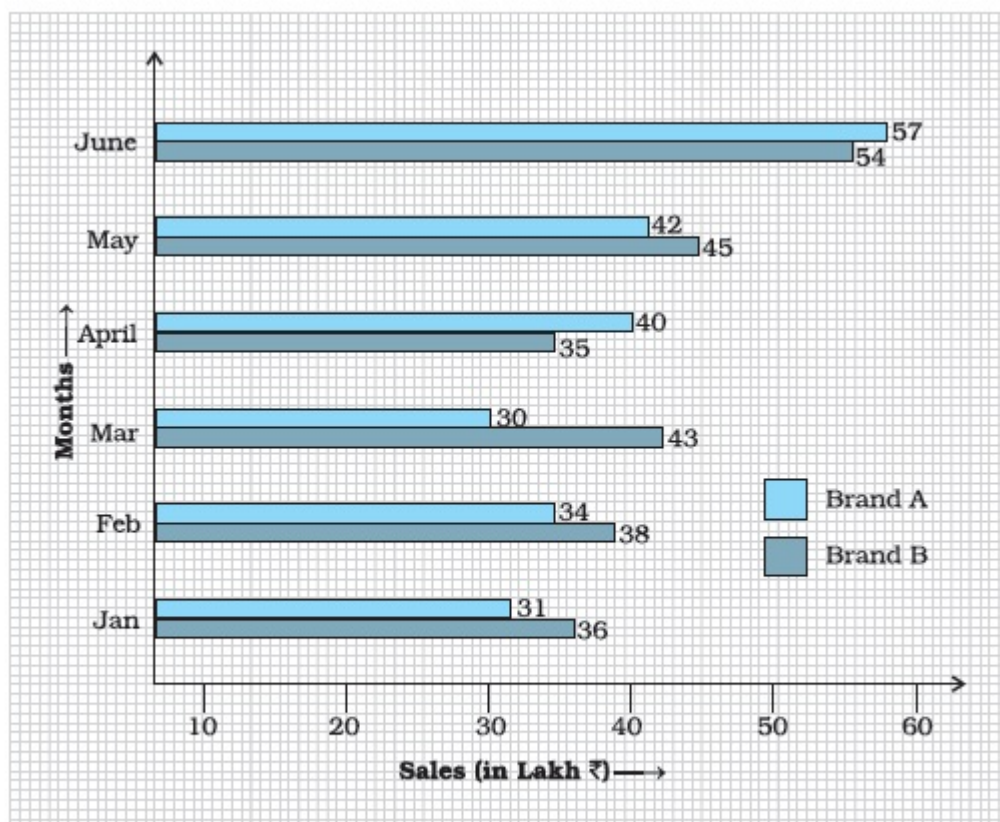


Fig. 3.12

- What information is represented by the above double bar graph?
- In which month sales of Brand A decreased as compared to the previous month?
- What is the difference in sales of both the Brands for the month of June?
- Find the average sales of Brand B for the six months.
- List all months for which the sales of Brand B was less than that of Brand A.

(f) Find the ratio of sales of Brand A as compared to Brand B for the month of January

Solution:

(a) The double bar graph represents the information about the comparison sales of two brands A and B during January to June.

(b) Sales of Brand A in the month of March is less than sales in the month of February. In the month of March, sales of Brand A decreased as compared to the previous month.

(c) Sales of Brand A in the month of June = ₹ 57 lakh
Sales of Brand B in the month of June = ₹ 54 lakh.

$$\begin{aligned}\text{Difference in sales} &= ₹ 57 \text{ lakh} - ₹ 54 \text{ lakh} \\ &= ₹ 3 \text{ lakh}\end{aligned}$$

$$\begin{aligned}\text{(d) Average sales of brand B} &= \frac{36 + 38 + 43 + 35 + 45 + 54}{6} \\ &= 41.83 \text{ lakh}\end{aligned}$$

(e) In the month of April and June, the sales of Brand B was less than that of Brand A.

(f) Sales of Brand A in the month of January = ₹ 31 lakh
Sales of Brand B in the month of January = ₹ 36 lakh

$$\begin{aligned}\text{Required ratio} &= \frac{31}{36} \\ &= 31:36\end{aligned}$$

79. Study the double bar graph given below and answer the questions that follow:

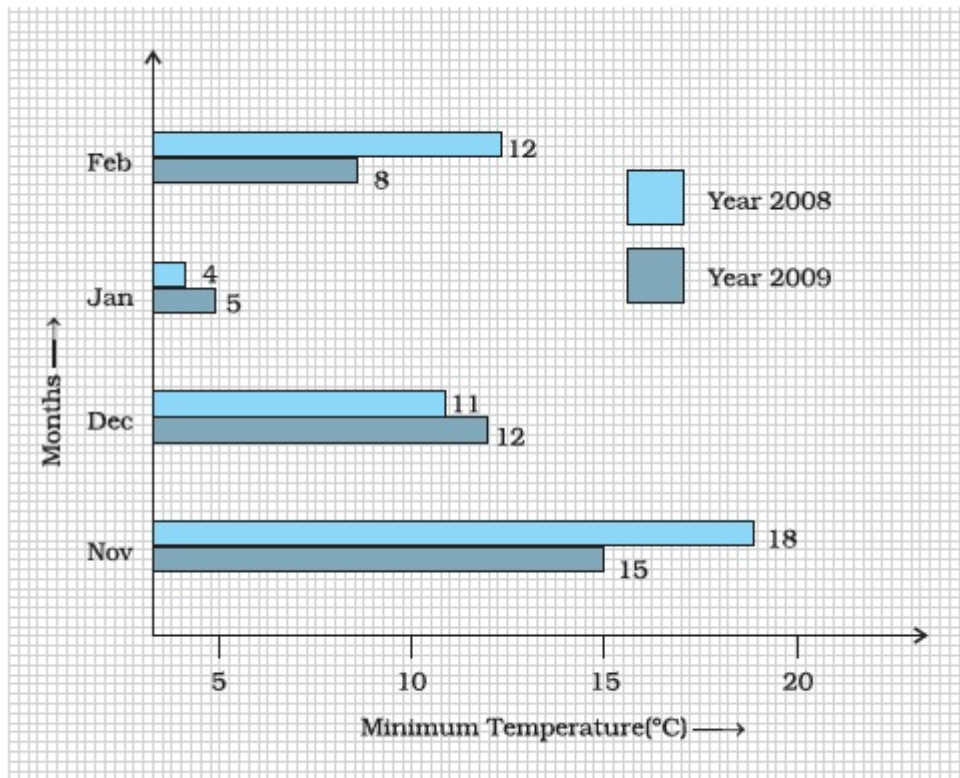


Fig. 3.13

- What information is compared in the above given double bar graph?
- Calculate the ratio of minimum temperatures in the year 2008 to the year 2009 for the month of November.
- For how many months was the minimum temperature in the year 2008 greater than that of year 2009? Name those months.
- Find the average minimum temperature for the year 2008 for the four months.
- In which month is the variation in the two temperatures maximum?

Solution:

(a) The double bar graph compares the information about minimum temperature (°C) of year 2008 and year 2009 during the months November to February

(b) Minimum temperature in the year 2008 for the month of November = 18°C

Minimum temperature in the year 2009 for the month of November = 15°C

$$\begin{aligned} \text{Required ratio} &= \frac{18}{15} \\ &= 6 : 5 \end{aligned}$$

(c) For the month of November and February, 2 months the minimum temperature in 2008 was greater than that of 2009

(d) Average minimum temperature for 2008;

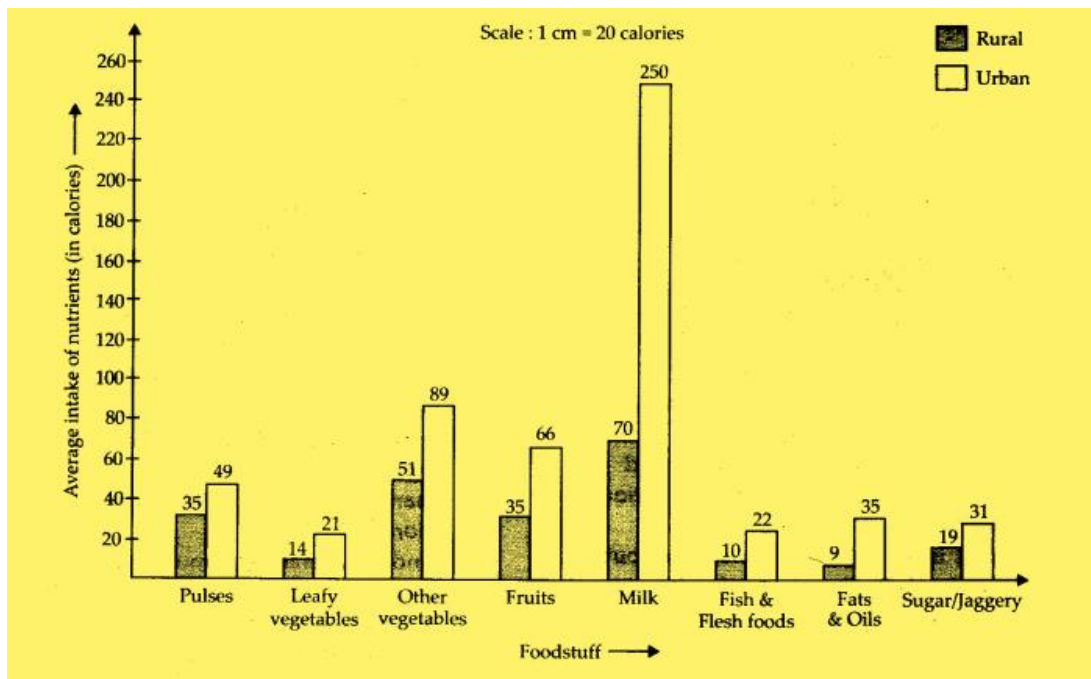
$$\begin{aligned}\text{Average temperature} &= \frac{18+11+4+12}{4} \\ &= \frac{45}{4} \\ &= 11.25\text{ }^{\circ}\text{C}\end{aligned}$$

(e) In the month of February, the variation in two temperatures is maximum.

80. The following table shows the average intake of nutrients in calories by rural and urban groups in a particular year. Using a suitable scale for the given data, draw a double bar graph to compare the data.

Foodstuff	Rural	Urban
Pulses	35	49
Leafy vegetables	14	21
Other vegetables	51	89
Fruits	35	66
Milk	70	250
Fish and flesh foods	10	22
Fats and Oils	9	35
Sugar/Jaggery	19	31

Solution:



81. Study the double bar graph and answer the questions that follow:

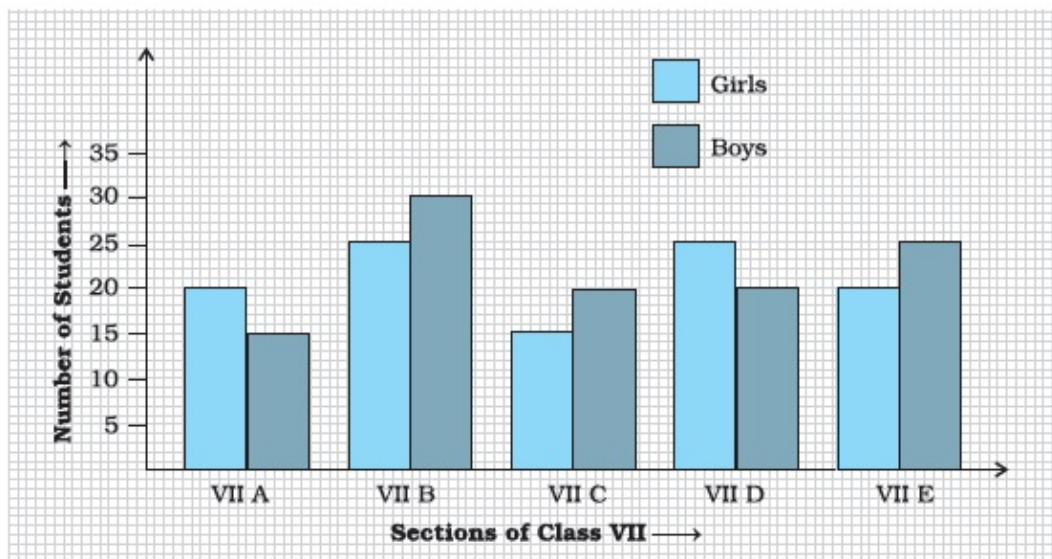


Fig. 3.14

- What information does the double bar graph represent?
- Find the total number of boys in all sections of Class VII.
- In which sections, the number of girls is greater than the number of boys?
- In which section, the number of boys is the maximum?
- In which section, the number of girls is the least?

Solution:

(a) The double bar graph represents the information about the number of girls and boys in different sections of Class VII

(b) Total number of boys in all sections of Class VIII = $15 + 30 + 20 + 20 + 25$
= 110

(c) In section A and D, the number of girls is greater than the number of boys.

(d) In section B, the number of boys is the maximum.

(e) In section C, the number of girls is the least.

82. In a public library, the following observations were recorded by the librarian in a particular week:

Days	Mon	Tues	Wed	Thurs	Fri	Sat
Newspaper Readers	400	600	350	550	500	350
Magazine Readers	150	100	200	300	250	200

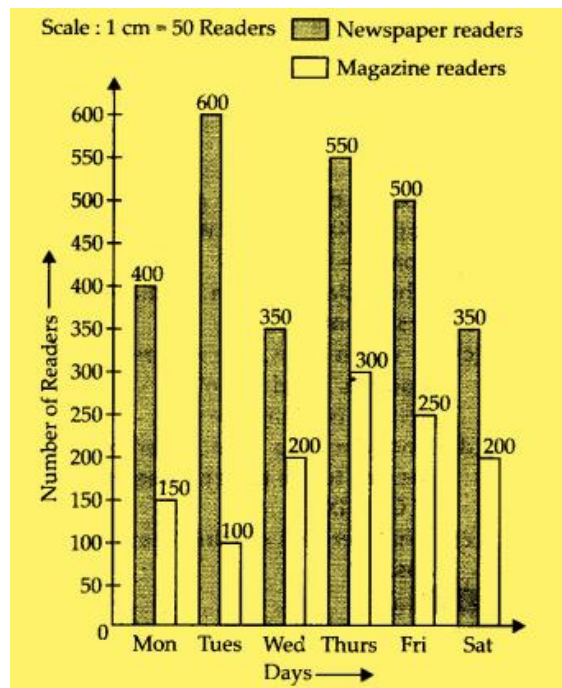
(a) Draw a double bar graph choosing an appropriate scale.

(b) On which day, the number of readers in the library was maximum?

(c) What is the mean number of magazine readers?

Solution:

(a)



(b)

Number of readers on Monday = $400 + 150 = 550$

Number of readers on Tuesday = $600 + 100 = 700$

Number of readers on Wednesday = $350 + 200 = 550$

Number of readers on Thursday = $550 + 300 = 850$

Number of readers on Friday = $500 + 250 = 750$

Number of readers on Saturday = $350 + 200 = 550$

Therefore, on Thursday, the number of readers in the library was maximum.

(c)

Total number of magazine readers = $150 + 100 + 200 + 300 + 250 + 200$
 $= 1200$

So,

$$\text{Mean} = \frac{1200}{6}$$

$$= 200$$

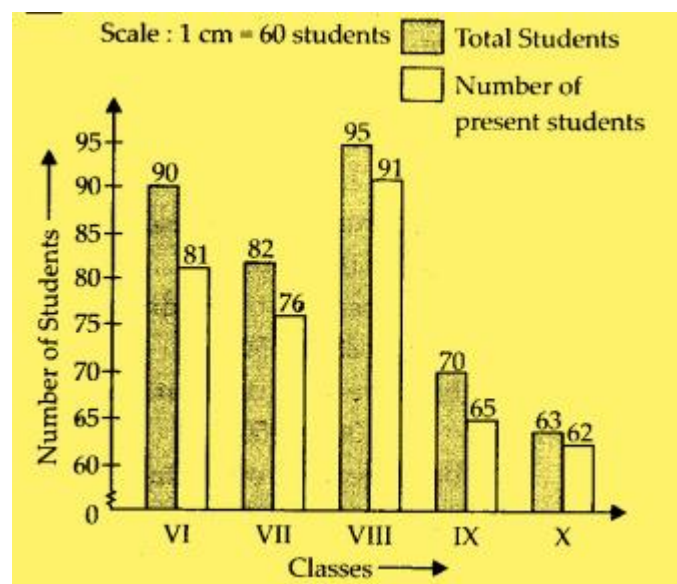
83. Observe the following data:

Government School, Chandpur		
Daily Attendance		Date : 15.4.2009
Class	Total Students	Number of Students Present on that Day
VI	90	81
VII	82	76
VIII	95	91
IX	70	65
X	63	62

- (a) Draw a double bar graph choosing an appropriate scale. What do you infer from the bar graph?
- (b) Which class has the maximum number of students?
- (c) In which class, the difference of total students and number of students present is minimum?
- (d) Find the ratio of number of students present to the total number of students of Class IX.
- (e) What per cent of Class VI students were absent?

Solution:

(a)



The double bar graph gives information about total number of students and number of students present from Class VI to Class X.

(b) Class VIII has the maximum number of students.

(c)

Difference of total students and number of students present in Class VI = $90 - 81$
 $= 9$

Difference of total students and number of students present in Class VII = $82 - 76$
 $= 6$

Difference of total students and number of students present in Class VIII = $95 - 91$
 $= 4$

Difference of total students and number of students present in Class IX = $70 - 65$
 $= 5$

Difference of total students and number of students present in Class X = $63 - 62$
 $= 1$

Therefore,

In Class X, the difference of total students and number of students present is minimum.

(d)

Total number of students in Class IX = 70

Number of present students in Class IX = 65

So,

$$\begin{aligned}\text{Required ratio} &= \frac{65}{70} \\ &= \frac{13}{14}\end{aligned}$$

(e) Total number of students in Class VI = 90

Number of students present in Class VI = 81

So,

Number of students absent in Class VI = $90 - 81$
 $= 9$

Hence,

$$\begin{aligned}\text{Percentage of students who were absent} &= \frac{9}{90} \times 100 \\ &= 90\%\end{aligned}$$

84. Observe the given data:

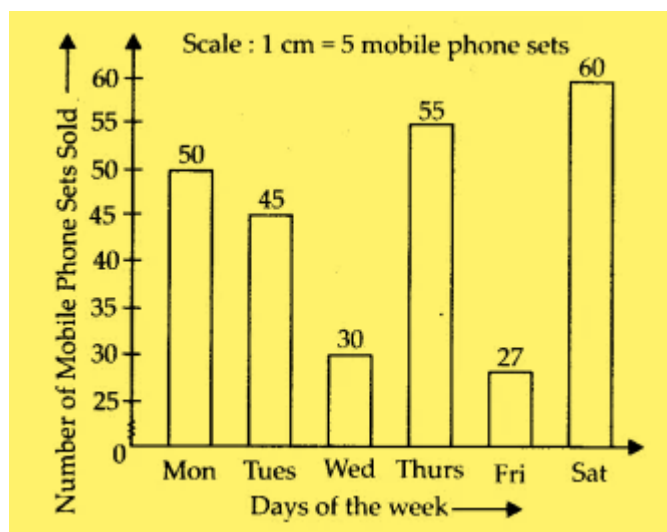
Days of the Week	Mon	Tues	Wed	Thurs	Fri	Sat
Number of Mobile Phone Sets Sold	50	45	30	55	27	60

(a) Draw a bar graph to represent the above given information.

- (b) On which day of the week was the sales maximum?
 (c) Find the total sales during the week.
 (d) Find the ratio of the minimum sale to the maximum sale.
 (e) Calculate the average sale during the week.
 (f) On how many days of the week was the sale above the average sales?

Solution:

(a)



(b) On Saturday, the sales was maximum.

(c) Total sale during the week = $50 + 45 + 30 + 55 + 27 + 60$
 $= 267$

(d) Maximum sale = 60
 Minimum sale = 27

So,

$$\begin{aligned}\text{Required ratio} &= \frac{27}{60} \\ &= \frac{9}{20}\end{aligned}$$

(e) Total sales during the week = $50 + 45 + 30 + 55 + 27 + 60$
 $= 267$

So,

$$\begin{aligned}\text{Average sale} &= \frac{267}{6} \\ &= 44.5\end{aligned}$$

(f) Average sale is 44.5.

So,

4 days of the week = Monday, Tuesday, Thursday and Saturday has the sale above the average sale.

85. Below is a list of 10 tallest buildings in India.

This list ranks buildings in India that stand at least 150m (492 ft.) tall, based on standard height measurement. This includes spires and architectural details but does not include antenna marks. Following data is given as per the available information till 2009. Since new buildings are always under construction, go on-line to check new taller buildings.

Use the information given in the table about sky scrapers to answer the following questions:

Name	City	Height	Floors	Year
Planet	Mumbai	181m	51	2009
UB Tower	Bengaluru	184 m	20	2006
Ashok Towers	Mumbai	193 m	49	2009
The Imperial I	Mumbai	249 m	60	2009
The Imperial II	Mumbai	249 m	60	2009
RNA Mirage	Mumbai	180 m	40	2009
Oberoi Woods Tower I	Mumbai	170 m	40	2009
Oberoi Woods Tower II	Mumbai	170 m	40	2009
Oberoi Woods Tower III	Mumbai	170 m	40	2009
MVRDC	Mumbai	156 m	35	2002

(a) Find the height of each storey of the three tallest buildings and write them in the following table:

Building	Height	Number of Storeys	Height of Each Storey

b) The average height of one storey for the buildings given in (a) is _____.

(c) Which city in this list has the largest percentage of skyscrapers? What is the percentage?

(d) What is the range of data?

(e) Find the median of the data.

(f) Draw a bar graph for given data.

Solution:

(a)

Building	Height	Number of Storeys	Height of Each Storey
The Imperial I	249 m	60	4.15 m
The Imperial II	249 m	60	4.15 m
Ashok Tower	193 m	49	3.9 m

(b) Average height of one storey for three tallest buildings;

$$\begin{aligned}
 &= \frac{3.9 + 4.15 + 4.15}{3} \\
 &= 4.06 \text{ m}
 \end{aligned}$$

(c) Mumbai has the largest percentage of sky scrappers

Total number of sky scrappers = 10

Total number sky scrappers in Mumbai = 9

So,

$$\begin{aligned}
 \text{Percentage of skyscrappers in Mumbai} &= \frac{9}{10} \times 100 \\
 &= 90\%
 \end{aligned}$$

(d) Range = Highest value – Lowest value

$$= 249 \text{ m} - 156 \text{ m}$$

$$= 93 \text{ m}$$

(e) Arranging the height (in m) in ascending order,

156, 170, 170, 180, 181, 184, 193, 249, 249

As, observations are even in number.

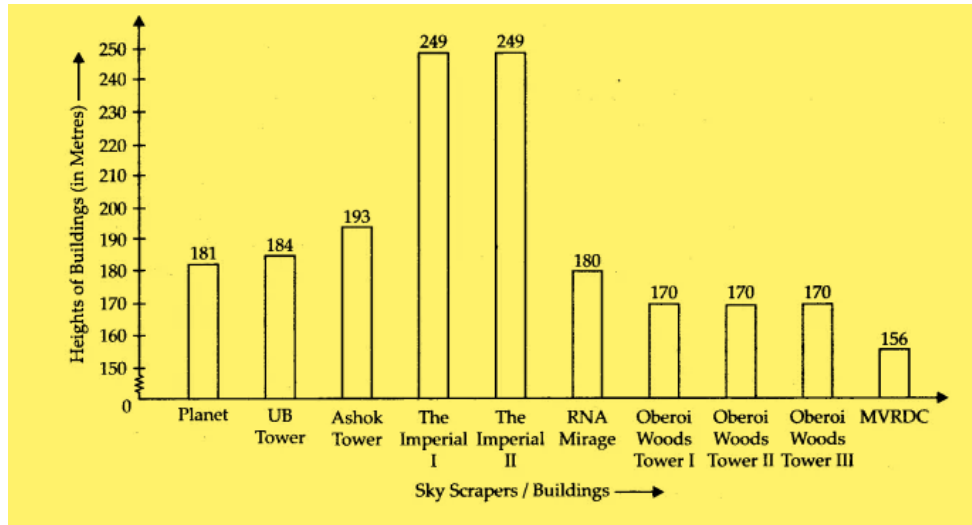
So,

Median = Mean of two middle most observations

$$= \frac{180 + 181}{2}$$

$$= 180.5 \text{ m}$$

(f)



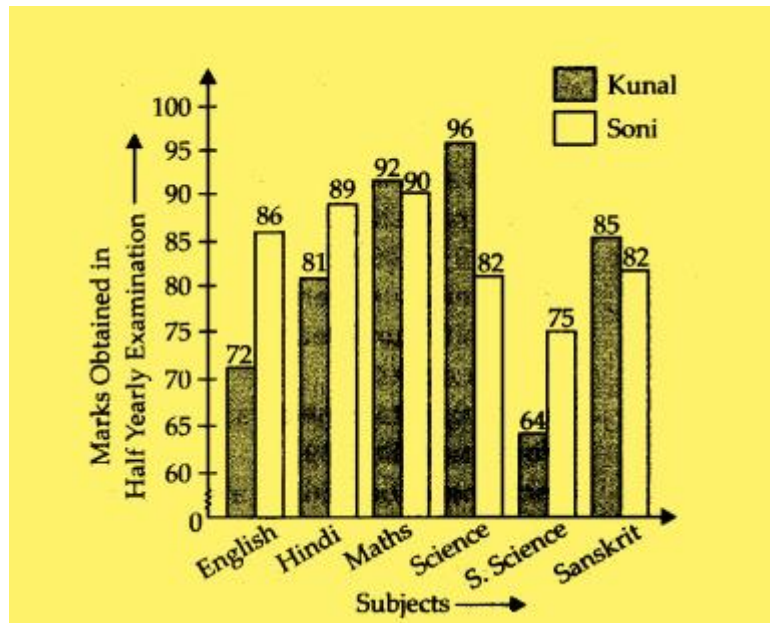
86. The marks out of 100 obtained by Kunal and Soni in the Half Yearly Examination are given below:

Subjects	English	Hindi	Maths	Science	S. Science	Sanskrit
Kunal	72	81	92	96	64	85
Soni	86	89	90	82	75	82

- Draw a double bar graph by choosing appropriate scale.
- Calculate the total percentage of marks obtained by Soni.
- Calculate the total percentage of marks obtained by Kunal.
- Compare the percentages of marks obtained by Kunal and Soni.
- In how many subjects did Soni get more marks than Kunal? Which are those subjects?
- Who got more marks in S. Science and what was the difference of marks?
- In which subject the difference of marks was maximum and by how much?

Solution:

(a)



(b) Total marks obtained by Soni = $86 + 89 + 90 + 82 + 75 + 82$
 $= 504$

Maximum marks = 6×100
 $= 600$

So,

Percentage of marks obtained by Soni = $\frac{504}{600} \times 100$
 $= 84 \%$

(c) Total marks obtained by Kunal = $72 + 81 + 92 + 96 + 64 + 85$
 $= 490$

Maximum marks = 6×100
 $= 600$

So,

Percentage of marks obtained by Kunal = $\frac{490}{600} \times 100$
 $= 81.6 \%$

(d)

Required ratio = $\frac{\text{Percentage marks of kunal}}{\text{Percentage marks of soni}}$
 $= \frac{81.6}{84}$
 $= \frac{34}{35}$

(e) In English, Hindi and S. Science , Soni get more marks than Kunal.

(f) Soni got more marks in S. Science and difference of marks = $75 - 64$
 $= 11$

(g) Difference of marks in English = $86 - 72$
 $= 14$

Difference of marks in Hindi = $89 - 81$
 $= 8$

Difference of marks in Maths = $92 - 90$
 $= 2$

Difference of marks in Science = $96 - 82$
 $= 14$

Difference of marks in S. Science = $75 - 64$
 $= 11$

Difference of marks in Sanskrit = $85 - 82$
 $= 3$

So, in English and Science, the difference of marks was maximum by 14 marks.

87. The students of Class VII have to choose one club from Music, Dance, Yoga, Dramatics, Fine arts and Electronics clubs. The data given below shows the choices made by girls and boys of the class. Study the table and answer the questions that follow:

Clubs	Music	Dance	Yoga	Dramatics	Fine Arts	Electronics
Girls	15	24	10	19	27	21
Boys	12	16	8	17	11	30

(a) Draw a double bar graph using appropriate scale to depict the above data.

(b) How many students are there in Class VII?

(c) Which is the most preferred club by boys?

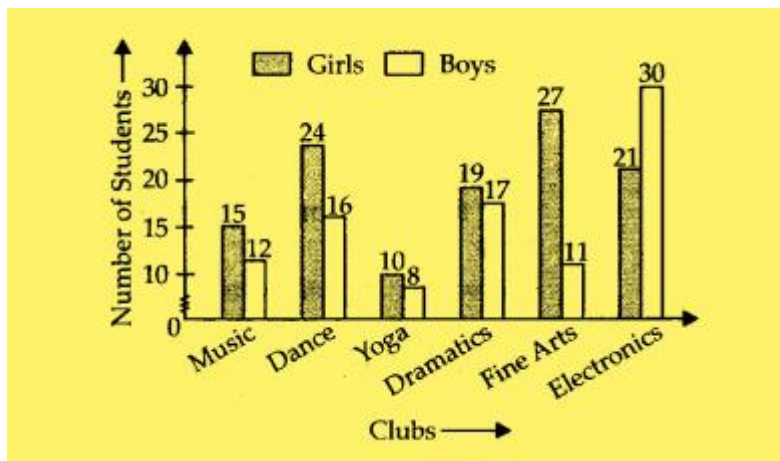
(d) Which is the least preferred club by girls?

(e) For which club the difference between boys and girls is the least?

(f) For which club is the difference between boys and girls the maximum?

Solution:

(a)



(b) Total number of girls in Class VII = $15 + 24 + 10 + 19 + 27 + 21$
 $= 116$

Total number of boys in Class VII = $12 + 16 + 8 + 17 + 11 + 30$
 $= 94$

So,

Total number of students in Class VII = $116 + 94$
 $= 210$

(c) Electronics club is the most preferred by boys.

(d) Yoga club is the least preferred by girls.

(e) Difference between the number of boys and girls for Music club = $15 - 12$
 $= 3$

Difference between the number of boys and girls for Dance club = $24 - 16$
 $= 8$

Difference between the number of boys and girls for Yoga club = $10 - 8$
 $= 2$

Difference between the number of boys and girls for Dramatics club = $19 - 17$
 $= 2$

Difference between the number of boys and girls for Fine Arts = $27 - 11$
 $= 16$

Difference between the number of boys and girls for Electronics club = $30 - 21$
 $= 9$

So, for Dramatics club and Yoga club the difference between the number of boys and girls is the least.

(f) For Fine Arts club, the difference between the number of boys and girls is the maximum.

88. The data given below shows the production of motor bikes in a factory for some months of two consecutive years.

Months	Feb	May	August	October	December
2008	2700	3200	6000	5000	4200
2007	2800	4500	4800	4800	5200

Study the table given above and answer the following questions:

(a) Draw a double bar graph using appropriate scale to depict the above information and compare them.

(b) In which year was the total output the maximum?

(c) Find the mean production for the year 2007.

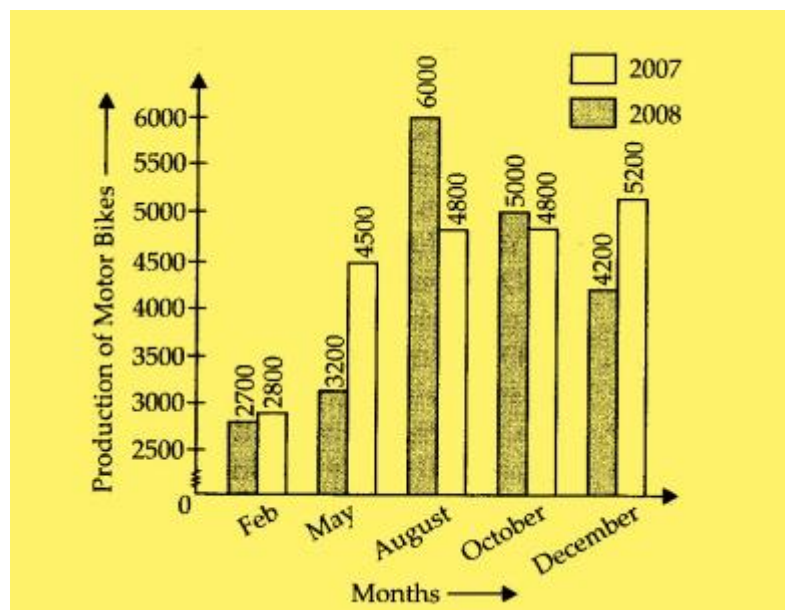
(d) For which month was the difference between the production for the two years the maximum?

(e) In which month for the year 2008, the production was the maximum?

(f) In which month for the year 2007, the production was the least?

Solution:

(a)



(b) Total output in year 2007 = $2800 + 4500 + 4800 + 4800 + 5200$
 $= 22100$

Total output in year 2008 = $2700 + 3200 + 6000 + 5000 + 4200$
 $= 21100$

So, in year 2007, the total output was the maximum.

(c) Total production for the year 2007 = 22100

So,

Mean production = $\frac{22100}{5}$

$$= 4420$$

(d) Difference between the production for February = $2800 - 2700$
 $= 100$

Difference between the production for May = $4500 - 3200$
 $= 1300$

Difference between the production for August = $6000 - 4800$
 $= 1200$

Difference between the production for October = $5000 - 4800$
 $= 200$

Difference between the production for December = $5200 - 4200$
 $= 1000$

So, in the month of May the difference between the production for two years was the maximum.

(e) In the month of August for the year 2008, the production was the maximum.

(f) In the month of February for the year 2007, the production was the lowest.

89. The table below compares the population (in hundreds) of 4 towns over two years:

Towns	A	B	C	D
2007	2900	6400	8300	4600
2009	3200	7500	9200	6300

Study the table and answer the following questions:

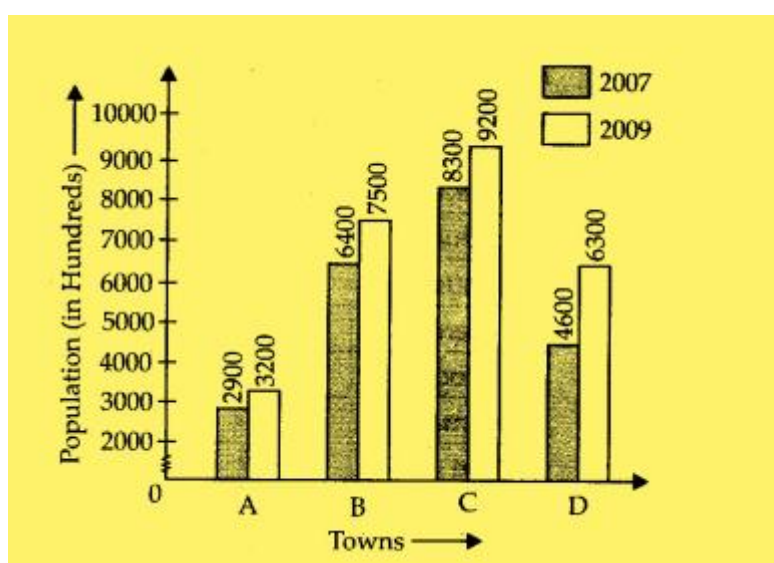
(a) Draw a double bar graph using appropriate scale to depict the above information.

(b) In which town was the population growth maximum?

(c) In which town was the population growth least?

Solution:

(a)



(b) Population growth in town A = $3200 - 2900$
 $= 300$

Population growth in town B = $7500 - 6400$
 $= 1100$

Population growth in town C = $9200 - 8300$
 $= 900$

Population growth in town D = $6300 - 4600$
 $= 1700$

So, in town the population growth was maximum.

(c) In town A, the population growth was the lowest.

90. The table below gives the data of tourists visiting 5 hill stations over two consecutive years. Study the table and answer the questions that follow:

Hill stations	Nainital	Shimla	Manali	Mussoorie	Kullu
2008	4000	5200	3700	5800	3500
2009	4800	4500	4200	6200	4600

(a) Draw a double bar graph to depict the above information using appropriate scale.

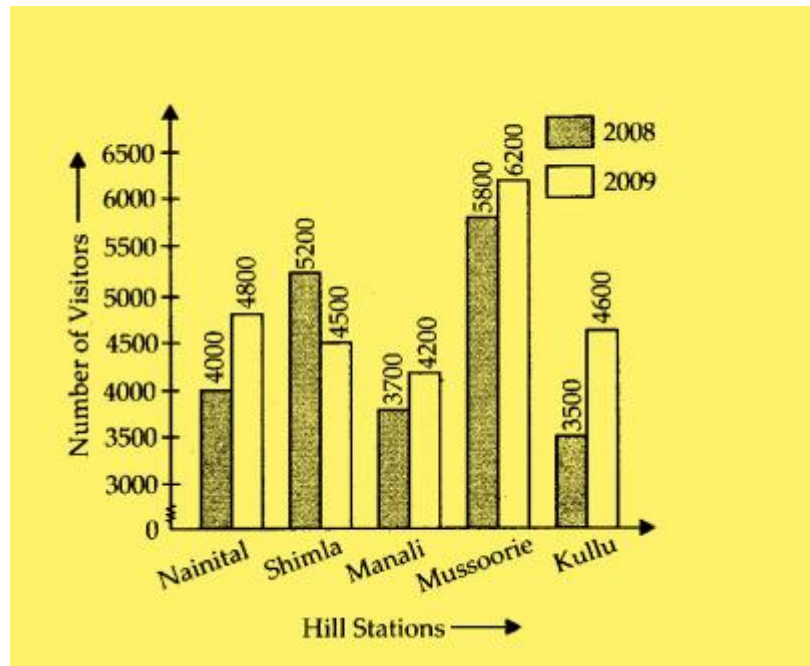
(b) Which hill station was visited by the maximum number of tourists in 2008?

(c) Which hill station was visited by the least number of tourists in 2009?

(d) In which hill stations was there increase in number of tourists in the year 2009?

Solution:

(a)



- (b) The hill station Mussoorie was visited by the maximum number of tourists in 2008.
- (c) The hill station Manali was visited by the least number of tourists in 2009.
- (d) In the hill stations Nainital, Manali, Mussoorie and Kullu, there was increase in number of tourists in the year 2009.

91. The table below gives the flavours of ice cream liked by children (boys and girls) of a society.

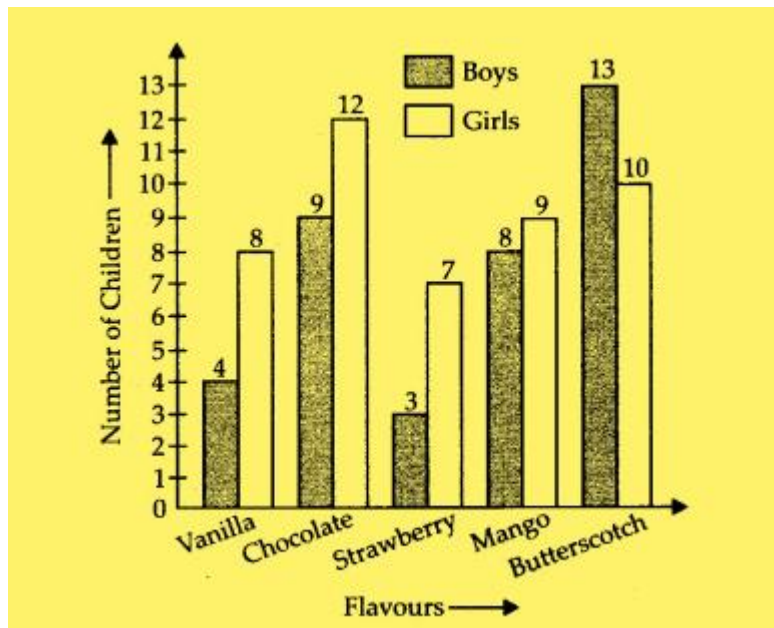
Flavours	Vanilla	Chocolate	Strawberry	Mango	Butterscotch
Boys	4	9	3	8	13
Girls	8	12	7	9	10

Study the table and answer the following questions:

- (a) Draw a double bar graph using appropriate scale to represent the above information.
- (b) Which flavour is liked the most by the boys?
- (c) How many girls are there in all?
- (d) How many children like chocolate flavour of ice cream?
- (e) Find the ratio of children who like strawberry flavour to vanilla flavour of ice cream.

Solution:

- (a)



(b) Butterscotch flavour is liked the most by the boys.

(c) Total number of girls = $8 + 12 + 7 + 9 + 10 = 46$

(d) Number of girls, like chocolate flavour = 12

Number of boys, like chocolate flavour = 9

Therefore,

$12 + 9 = 21$ children like chocolate flavour of ice cream.

(e) Total number of children who like strawberry flavour = $3 + 7$
 $= 10$

Total number of children who like vanilla flavour = $4 + 8$
 $= 12$

So,

$$\begin{aligned} \text{Required ratio} &= \frac{10}{12} \\ &= \frac{5}{6} \end{aligned}$$