CHAPTER 16
DATA HANDLING

Question 1.
Find the range of the following data:
21, 16, 30, 15, 16, 18, 10, 24, 26, 20
Solution:
Greatest number 30
Smallest number = 10
Range = 30 – 10 = 20

Question 2.
Find the mode of the following data:
24, 26, 23, 26, 22, 25, 26, 28
Solution:
Arranging the given data with the same value together, we get
22, 23, 24, 25, 26, 26, 26, 28
Here, 26 occurs the greatest number of times i.e. 3 times
Thus, the required mode = 26

Question 3.
Find the median of the following data:
8, 6, 10, 12, 14
Solution:
Let us arrange the given data in increasing order,
6, 8, 10, 12, 14
n = 5 (odd)
Median = $(n+1/2)$th term = 3rd term = 10
Thus, the required median = 10.

Question 4.
A fair die is rolled, find the probability of getting a prime number.
Solution:
Number on a die = 1, 2, 3, 4, 5, 6
n(S) = 6
Prime numbers = 2, 3, 5
n(E) = 3
Probability = $n(E)/n(S) = 3/6 = 1/2$
Thus the required probability = $1/2$.

Question 5.
A bag contains 5 white and 9 red balls. One ball is drawn at random from the bag. Find the probability of getting
(a) a white ball
(b) a red ball
Solution:
Total number of balls = 5 + 9 = 14 balls
n(S) = 14
(i) Number of white ball = 5

n(E) = 5
Probability of getting white ball = $n(E)/n(S) = 5/14$
(ii) Number of red balls = 9
n(E) = 9
Probability of getting white ball = $n(E)/n(S) = 9/14$

Question 6.
A dice is tossed once. Find the probability of getting
(i) a number 5
(ii) a number greater than 5
(iii) a number less than 5
(iv) an odd number
(v) an even number
(vi) a number greater than 6
Solution:
Total number of outcomes = 6
n(S) = 6
(i) An event of getting a number 5
n(E) = 1
Probability = $n(E)/n(S) = 1/6$
(ii) An event of getting a number 5 greater than 5, i.e., 6
n(E) = 1
Probability = $n(E)/n(S) = 1/6$
(iii) An event of getting a number less than 5, i.e., 1, 2, 3 and 4.
n(E) = 4
Probability = $n(E)/n(S) = 4/6 = 2/3$
(iv) An event of getting an odd number, i.e., 1, 3 and 5.
n(E) = 3
Probability = $n(E)/n(S) = 3/6 = 1/2$
(v) An event of getting an even number, i.e., 2, 4 and 6.
n(E) = 3
Probability = $n(E)/n(S) = 3/6 = 1/2$
(vi) An event of getting a number greater than 6, i.e., Nil.
n(E) = 0
Probability = $n(E)/n(S) = 0/6 = 0$

Question 7.
A coin and a die are tossed once together. Find the total number of outcomes.
Solution:
A coin has two faces, Head (H) and Tail (T)
A die has six faces marked with numbers 1, 2, 3, 4, 5, 6
Possible outcomes are:
H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6
Total number of outcomes = 2 × 6 = 12

EXTRA IMPORTANT QUESTION

Question 1. Find the range of height of any of the ten students of a class.

Answer 1:-

Let us assume that the height in cm of 10 students in a class.

= 130, 132, 135, 142, 137, 139, 140, 143, 145 and 148

By observing the above-mentioned given values, the highest value is found to be= 148 cm.

By observing the above-mentioned given values, the lowest value is found to be= 130 cm.

Then,

Range of Heights is equal to be = Highest value – The lowest value

= 148 – 130

= 18 cm

Question 2. Determine the Mean of the first five whole numbers.

Answer 2:-

The first five Whole numbers present are 0, 1, 2, 3, and 4.

Mean is equal to = (Sum of first five whole numbers) divided by (Total Number of whole numbers)

Then,

The Sum of five whole numbers is = 0 + 1 + 2 + 3 +4

= 10

The total number of whole numbers present is = 5

Mean = (10/5)

= 2

Hence, the final Mean of the first five whole numbers is two.

Question 3. A cricketer scores the following below runs in his eight innings: 58, 46, 76, 40, 35, 45, 0 and 100. Determine the mean score.

Answer 3:-

Mean score is equal to = (Total runs scored by the cricketer in all innings) divided by (Total Number of innings

Played by the cricketer)

Total runs that is scored by the cricketer in all of his innings = 58 + 76 + + 45 + 0 + 100 +40 + 35 + 46

= 400

The total number of innings is = 8

Then,

Mean is = (400/8)

= 50

Hence, the Mean score of the cricketer is 50.

Question 4. The marks out of 100 obtained by the group of students in the science test in their class are 85, 76,

90, 56, 95, 85, 39, 48, 81 and 75.

Now Find the:

(a) Highest and lowest marks obtained by the students.

(b) Range of the marks obtained.

(c) Mean marks obtained by the student's group.

Answer 4:-

Firstly, we have to arrange the marks obtained by the group of students in the science test in an ascending order, which is

= 39, 48, 56, 85, 85, 90, 95, 75, 76, 81

(a) The highest mark obtained by the student on the test is= 95

The lowest mark obtained by the student on the test was = 39

(b) We know that range = Highest marks – Lowest marks

= 95 – 39

= 56

(c) Mean of Marks is equal to = Sum of all the marks obtained by these groups of students divided by the Total Number of students

= (39 + 48 + 56 + 85 + 85 + 75 + 76 + 81+ 90 + 95) divided by 10

= 730/10

= 73

Question 5. The enrolment in a school during their six consecutive years is as follows:

1555, 1670, 1750, 2013, 2540 and 2820.

Find the mean enrolment of their school for this period.

Answer 5:-

Mean enrolment is equal to = Sum of all observations divided by the number of observations

= (1555 + 1670 + 1750 + 2013 + 2540 + 2820)/ 6

= (12348/6)

= 2058

Hence, The final mean enrolment of the school for the given period is 2058.

Question 6. The heights of ten girls were measured in cm, and then the results are given as follows:

135, 150, 139, 146, 128, 151, 132,149, 143 and 141.

(a) What is the height found of the tallest girl?

(b) What is the height of the shortest girl?

(c) What is the range of the data?

(d) What is the mean height found of the girls?

(e) How many girls have heights that are more than the mean height?

Answer 6:-

Firstly we will have to arrange the given data in ascending order,

= 128, 141, 143, 132, 135, 139, 146, 149, 150 and 151

(a) The height of the tallest girl is 151 cm

(b) The height of the shortest girl is 128 cm

(c) Range of given data is equal to = Tallest height – Shortest height

= 151 – 128

= 23 cm

(d) Mean height of the girls is equal to = Sum of the height of all the girls divided by the total number of girls present

= (128 + 132 + 143 + 135 + 139 + 141 +146 + 149 + 150

+ 151) divided by 10

= 1414/10

= 141.4 cm

(e) Five girls have heights which is more than the mean height (which is 141.4 cm).

Question 7. The scores in a mathematics test (out of 25) of the 15 students in a class are as follows:

19, 25, 10, 5, 16, 25, 23, 20, 9, 20, 15, 20, 24, 12 and 20

Find the Mode and the Median of this data. Are they the same?

Answer 7:-

Arranging the following given scores in ascending order, we receive

5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25 and 25

Mode,

Mode is determined as the value of the variable which is present most frequently.

Clearly, the number 20 occurs the maximum number of times.

Hence, the Mode of these given sores is 20

Median is,

The value of that middle observation is called the median of the data.

Here the n = 15, which is odd.

There, n is the number of students present.

∴median is the = value of ½ (n + 1)the observation.

= ½ (15 + 1)

= ½ (16)

= 16/2

= 8

Then, the value of the 8th term = 20

So, the Median is the 20.

Yes, both values are the same.

Question 8. The runs scored in the cricket match by the 11 players are as follows:

6, 15, 80, 120, 50, 100, 10, 15, 8, 10 and 15

Find the Mean, Mode and the Median of this data. Are these three same?

Answer 8-

Arranging the runs scored in the cricket match by these 11 players in ascending order, we receive

6, 8, 10, 10, 15, 15, 15, 50, 80, 100 and 120

Mean,

The mean of the given above data is given as = Sum of all of the observations divided by the total number of observations in the above-given data.

= (6 + 8 + 10 + 10 + 15 + 15 + 15 + 50 + 80 + 100 + 120) divided by 11

= 429/11

= 39

Mode,

Mode is determined as the value of the variable which is present most frequently.

So, Clearly, the number 15 occurs the maximum number of times.

Hence, the Mode of these given scores is 15

Median is,

The value of the middle-most observation of the data.

Here n = 11, which is an odd number.

Where n is the number of players.

Hence median is = value of ½ (n + 1)the observation.

= ½ (11 + 1)

= ½ (12)

= 12/2

= 6

Then, the value of the 6th term = 15

Hence, the Median is 15.

No, these three (mean, Median and Mode) are not the same.

Question 9. The weights (in kg.) of 15 students present in a class are:

38, 42, 43, 35, 37, 45, 50, 32, 43, 40, 36, 38, 43, 38 and 47

(i) Determine the Mode and Median of the above data.

(ii) Is there more than one Mode possible?

Answer 9-

Arranging the above-given weights of 15 students present in the class in ascending order, we receive,

32, 35, 36, 37, 38, 38, 38, 40, 42, 43, 43, 43, 45, 47, 50

(i) Data's Mode and Median

Mode,

Mode is determined as the value of the variable which is present most frequently.

S, Clearly, the number 38 and 43 both occurs three times.

Hence, the Mode of the given weights is both 38 and 43.

Median is,

The value of the middle-most observation of the data.

Here n = 15, which is an odd number.

Where n is the number of students.

Hence the median is equal to the value of ½ (n + 1) of the observation.

Which is equal to = ½ (15 + 1)

= ½ (16)

= 16/2

= 8

Now, the value of the 8th term = 40

Hence, the median will be 40.

(ii) Yes, there are two modes present for the given weights of the students.

Question 10. Find both the Mode and Median of the given data: 13, 14, 19, 16, 12, 12, 14, 13, 14

Answer 10:-

Arranging the above-given data in ascending order, we receive

= 12, 12, 13, 13, 14, 14, 14, 16, 19

Mode is determined as the value of the variable which is present most frequently.

Clearly, the number 14 occurs a maximum number of times.

Hence, the Mode of this given data is found to be14.

Median is,

The value of the middle-most observation of the data.

Here n = 9, which is an odd number.

Where n denotes the number of students.

Hence, the median = value of ½ (9 + 1)the observation.

= ½ (9 + 1)

= ½ (10)

= 10/2

= 5

Then, the value of the 5th term = 14

Hence, the median is the number 14.