STATISTICS
KEY POINTS

- In Statistics we study collection, presentation, analysis and interpretation of data.

- Facts or figures collected with a definite purpose are called data.

- The number of times an observation occurs in the given data is called frequency of the observation.

- Classes intervals are the groups in which all observations are divided.

- For class interval 20-30, 30 is called upper class limit and 20 is called lower class limit.

- Class mark $= \dfrac{\text{Lower class limit} + \text{upper class limit}}{2}$

- Average or mean $= \dfrac{\text{Sum of all observations}}{\text{number of observations}}$

- For raw data mean $(\bar{x}) = \dfrac{\sum\limits_{i=1}^{n} xi}{n}$ Mean $(\bar{x}) = \dfrac{X_1 + X_2 + \ldots + X_n}{n}$

- When frequency fi is given Mean $\bar{x} = \dfrac{\sum\limits_{i=1}^{n} fi\, x_i}{\sum\limits_{i=1}^{n} fi}$

- Mode is the value of observation which occurs most frequently.

- For Median arrange the data in ascending order or descending orders.

  If number of observations 'n' is odd

  median $= \dfrac{(n+1)^{th}}{2}$ term

  If number of observations 'n' is even

  median $= \dfrac{\left(\dfrac{n}{2}\right)^{th} \text{term} + \left(\dfrac{n}{2}+1\right)^{th} \text{term}}{2}$

PART-A

1. The marks of 5 students in a subject out of 50 are 32, 48, 50, 27, 37. Find the range of marks.

2. A data contains 64 as the highest value and its range is 13. What is its lowest value of data?

3. What is the class mark of the class interval 4.7-6.3?

4. If class mark of a class interval is 8.5. The class size is 5. Find the class limits of the corresponding class interval.

5. In a bar graph 0.2 cm length of a bar represents 100 people. What is the length of bar which represents 1300 people?

6. Find the mean of first 5 Prime numbers.

7. The mean of 5 observations is 10. If each observation of the data is increased by 5. Find the new mean.

8. If the mean of 10 observations is 15. Find the sum of all observations.

9. The mean of three numbers is 7. If two numbers are 7 and 8. Find the third number.

10. If the mean of 6, 8, 5, 7, x and 4 is 7 then find the value of x.

11. The mode of 4, 9, 5, 4, 9, 5, 4, 9 and x-10 is 9 Find x.

12. If the median of the data arranged in ascending order as 6,9,15, x+4, x+8, x+11, 30, 32 is 19 find x.

13. The mean of the data $x_1, x_2, x_3 .... x_n$ is 10. Find mean of $5x_1$, $5x_2$, $5x_3$ .... $5x_n$

PART-B

14. Write the class size and class limits of 104, 114, 124, 134.

15. If the mean of the observations x, 2x+1, 2x+5, 2x+9 is 30. What is mean of last two observations?

16. Find the mean from the following table.

xi	5	6	7	8	4
fi	3	2	1	3	2

17. The mean of five numbers is 27. If one of the number is excluded, the mean gets reduced by 2. What is the value of the excluded number?

18. Find the mode of the data 15, 14, 19, 20, 14, 15, 16, 14, 15, 18, 14, 19, 15, 17, 15. If last observation is changed to 14 then find the new mode.

19. If the median of the data arranged in ascending order is 63, find the value of x in the data 29, 32, 48, x-2, x, x+2, 72, 78, 84, 95.

20. The mean monthly salary of 40 workers of a factory is x in a particular year. Each one was given 3000 as Diwali Bonus. What will be the mean monthly salary in that month.

21. In the question 20 instead of bonus, r300 be deducted from each workers salary for April to February. What will be their mean monthly salary for December month?

22. For what value of x the mode of the following data is 17. The frequency of x is maximum. 13, 24, 13, 27, 17, 16, 17, x, 22, 21, 13, 17 ?

23. The average age of Shikha and her husband Amit is 48 years. The average age of Shikha, Amit and their daughter Advika is 39 years. Find the age of Advika.

24. The mean of 6, 10, 11,, x, 12, y is 10. Also y is 7 more than x. Find the value of x and y.

PART-C

25. In three unit tests of Mathematics Priya got 75, 82 and 90 marks. How many marks must she obtain in Unit Test IV to have an average of 85 in all the four unit tests?

26. Time taken in seconds by 25 students in an examination to solve certain question is given below.

    20, 16, 20, 27, 27, 28, 30, 33, 37, 50, 40, 42, 46, 38, 43, 46, 46, 48, 49, 53, 58, 59, 60, 64, 52.

    By ,taking class interval of size 10, make a frequency distribution table.

27. Find the mean from the following table

x_i	5	15	25	35	45
f_i	6	4	9	6	5

28. Draw the histogram from the following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	8	15	20	12	16

29. Given below is a cumulative frequency distribution table showing the marks scored by 50 students of a class.

Marks	Number of students
Below 20	17
Below 40	22
Below 60	29
Below 80	37
Below 100	50

Form a frequency table from the above data.

30. Given below are the seats won by different political parties in a state assembly election.

Political Party	A	B	C	D	E	F	G
Seat Won	75	55	37	29	10	37	50

Draw a bar graph for above data.

31. Find the value of 'p' from the following distribution if the mean is 6.

xi	2	4	6	10	p+5
fi	3	3	3	1	2

32. Give below is the data of students who participated in different activities.

Activity	Sports	Meditation	Yoga	Walking
No. of Girls	42	35	100	120
No. of Boys	90	64	130	86

Draw double bar graph.

33. The distance travelled by 40 engineers in (km) from their place of work were found as follows.

5	3	10	20	25	11	13	7	12	31
19	10	12	17	18	11	32	17	16	2
7	9	7	8	3	5	12	15	18	3
12	14	2	9	6	15	15	7	6	12

construct a group frequency distribution table with class size 5 for the data given above taking first interval 0-5 (5 not included).

34. Define the term "Median". If the median of 6, 7, x-2, x, 17, 20 written in ascending order is 16. Find the value of x.

35. Draw histogram to represent the data given below.

Age (in years)	No. of children
1 - 2	5
2 - 3	4
3 - 5	10
5 - 7	12
7 - 10	9
10 - 15	10
15 - 17	8

36. The mean marks of boys & girls in periodical test are 36 and 39 respectively. If the mean marks of all the students of class IX in that test are 37. Find the ratio of the number of boys to the number of girls.

PART-D

37. The mean of the following data is 50.

xi	10	30	50	70	90
fi	17	5a+3	32	7a-11	19

Find 'a' and the frequencies for xi = 30 & xi = 70

38. Draw a frequency polygon for the following data

Marks	Frequency
0-10	03
10-20	09
20-30	18
30-40	16
40-50	12
50-60	02

39. If the 26 English alphabets are taken such that A=1, B=2, C=3,........., Z=26 then find

    (i) the mean and median of the numbers corresponding to the vowels.

    (ii) Which alphabet corresponds to the median.

40. In a school a student who scored 80% or above in his/her previous class is eligible for "Merit scholarship" Marks obtained by two students Nishi and Vinayak of class IX in their previous class (VIII) in all subjects are given below.

Name	Hindi	English	Maths	Science	SSt.	Skt.
Nishi	78	74	86	85	73	83
Vinayak	79	76	88	83	71	85

Find average percentage score of Nishi and Vinayak, which of the two are eligible for merit scholarship?

41. The blood group of 30 students of class IX are recorded as follows.

A, B, B, B, O, B, B, A, AB, A, O, B, O, AB, O

AB, AB, B, AB, B, A, O, AB, B, A, O, AB, A, A, AB

a) Make a frequency distribution table for the above data.

b) Mr. 'X' meets an accident and needs blood. His blood group is AB. How many of these students can donate their blood to Mr. 'X'?

42. 15 students of Govt. school spend the following numbers of hours in a month for doing, cleaning in their street 25, 15, 20, 20, 9, 20, 25, 15, 7, 13, 20, 12, 10, 15, 8

Find mean, median and mode from above data.

43. In an assembly election the number of seats won by the different political parties is shown below.

Political Party	A	B	C	D	E	F	G
No. of Seats	1	47	15	2	19	1	5

i) Draw a bar graph.

ii) Which political party won by availing maximum number of seats?

44. A doctor suggests two ways for treatment of a particular diseases one by taking medicine only and other by doing meditation and yoga.

Age group	No. of patients taking medicines	No. of patients doing meditation & yoga
20-30	20	05
30-40	30	12
40-50	42	20
50-60	40	30
60-70	30	20

i) Draw Frequency polygon for the above data on the graph.

45. The following table given the distribution of students of two sections according to marks obtained by them.

Section A		Section B	
Marks	Frequency	Marks	Frequency
0-10	3	0-10	5
10-20	9	10-20	19
20-30	17	20-30	15
30-40	12	30-40	10
40-50	9	40-50	1

Represents the marks of both the sections on the same graph by two frequency polygons.

46. The following table shows number of voluntary blood donor as per day in voluntary blood donation camp organized Delhi.

Days	No. of Donars
Sunday	100
Monday	80
Tuesday	110
Wednesday	80
Thursday	60
Friday	70
Saturday	120

i) Draw a bar graph showing above informations.

ii) On which day donation was maximum and on which day it was minimum.

STATISTICS
ANSWERS

1. 23
2. 51
3. 5.5
4. 6-11
5. 2.6cm
6. 5.6
7. 15
8. 150
9. 6
10. 12
11. 19
12. 13
13. 50
14. 10, 99-109, 109-119, 119-129, 129-139
15. 37
16. 06
17. 35
18. 15, 14
19. 64
20. $x + 3000$
22. 17
23. 21 years
24. $x = 7, y = 14$
25. 93

26.

15-25	25-35	35-45	45-55	55-65
3	5	5	8	4

27. 25

29.

Class	0-20	20-40	40-60	60-80	80-100
Freq.	17	5	7	8	13

31. P=7

33. Mean 15.6, Median=15, Mode=20
34. x=17
36. 2 : 1
37. 5, 28, 24
39. 9.8, 9, I
40. 79.83, 80.33, Vinayak
41. a) 30,   b) 6
42. Mean = 15.6, Median = 15, Mode= 20
43. (i) B   (ii) 18 years
46. (ii) Saturday, Thursday

PRACTICE TEST

Statistics

1. Write class size and class limits of the following: (1)
    47, 52, 57, 62, 67, 72, 77

2. Find the value of "x" if mode of the following data is 5. Find the x. (1)

    2, 4, 3, 5, 4, 5, 6, 4, x, 7, 5

3. The median of the following observations arranged in ascending order is 25. Find the x. (2)

    11, 13, 15, 19, x + 2, x + 4, 30, 35, 39, 46

4. Find the median of the first 10 natural numbers. Is it equal to their mean? (2)

5. The mean of 40 observations was 160. It was detected on rechecking that the value of 165 was wrongly copied as 125 for computation of mean. Find the correct mean. (3)

6. If the mean of the following distribution is 6. Find the value of "R". (3)

X	2	4	6	8	R + 5
F	3	2	3	1	2

7. Draw histogram of the weekly pocket expenses of students of a School given below (4)

Weekly Expenses(Rs.)	No. of Students
10 – 20	10
20 – 30	15
30 – 50	40
50 – 60	25
60 – 90	30
90 – 100	5

8. Draw Histogram and Frequency polygon. (4)

Marks	0 - 10	10-20	20-30	30-10	40-50	50-60	60 - 70
No. of Students	5	10	4	6	7	3	2