MATHS

BOOKS - MBD

STATISTICS

Example

1. A survey was conducted by a groupofstudentsas a part of their enviromentawareness programme, in which

they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants	0 – 2	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12	12 – 14
Number of houses	1	2	1	5	6	2	3

Which method did you use for finding the mean, and why?

2. Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in ₹)	100 –120	120– 140	140 – 160	160 – 180	180 – 200
Number of workers	12	14	8	6	10

Find the

mean daily wages of the workers of the factory by using an appropriate method.

3. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is rs18. Find the missing frequency f.

Daily pocket allowance (in ₹)	11– 13	13 – 15	15 – 17	17 – 19	19 – 21	21 – 23	23 – 25
Number of children	7	6	9	13	f	5	4

4. Thirty women were examined in.a hospital by a doctor and the number of heart beats per minute were recorded and summarised as follows. Find the meanheart beats per minute for these women, choosing a suitable method.

Number of heart beats per minute	65 – 68	68 – 71	71 – 74	74 – 77	77 – 80	80 – 83	83 – 86
Number of women	2	4	3	8	7	4	2

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5. The table below shows the daily expenditure on food of 25 households in a locality.

Daily expenditure (in ₹)	100–150	150–200	200–250	250–300	300–350
Number of households	4	5	12	2	2

Find the mean daily expenditure on food by a suitable method.

6. A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent.

Number of days	0 – 6	6 – 10	10 – 14	14 – 20	20 – 28	28 – 38	38 – 40
Number of students	11	10	7	4	4	3	1

7. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate.

Literacy rate (in %)	45 – 55	55 – 65	65 – 75	75– 85	85 – 95
Number of cities	3	10	11	8	3

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8. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components :

Life times (in hours)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Frequency	10	35	52	61	38	29

Determine the modal lifetimes of the components

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9. The following data gives the distribution of total monthly household expenditure of 200 families of a village. Find the modal monthly expenditure of the families. Also, find the

mean monthly expenditure :

Expenditure (in ₹)	Number of families
1000 – 1500	24
1500 – 2000	40
2000 – 2500	33
2500 – 3000	28
3000 – 3500	30
3500 – 4000	22
4000 – 4500	16
4500 – 5000	7

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10. The following distribution gives the state-wise teacher-student ratio in higher secondary schools of India. Find the mode and mean of

this data.Interpret, the two measures.

Number of students per teacher	Number of States/U.T.
15 – 20	3
20 – 25	8
25 – 30	9
30 – 35	10
35 – 40	3
40 – 45	0
45 – 50	0
50 – 55	2

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11. The given distribution shows the number of

runs scored by some top batsmen of the world

in one-day international cricket matches

Runs scored	Number of batsmen
3000 – 4000	4
4000 – 5000	18
5000 – 6000	9
6000 – 7000	7
7000 – 8000	6
8000 – 9000	3
9000 – 10000	1
10000 – 11000	1

Find the mode of the data.

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12. A student noted the number of cars passing through a spot on a road for 100 periods each of 3 minutes and summarised it in the table given below. Find the mode of the

data :

Number of cars	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Frequency	7	14	13	12	20	11	15	8

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13. The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption (in units)	Number of consumers
65 –85	4
85 – 105	5
105 – 125	13
125 – 145	20
145 – 165	14
165 – 185	8
185 –205	4

14. If the median of the distribution given below is 28.5, find the values of x and y.

Class interval	Frequency
0 – 10	5
10 – 20	x
20 – 30	20
30 – 40	15
40 – 50	y
50 – 60	5
Total	60

15. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 year.

16. The length of 40 leaves of a plant are measured correct to one millimetre, and the

obtained data is represented in the following table.

Length in mm	Number of leaves
118-126	3
127-135	5
136-144	9
145-153	12
154-162	5
163-171	4
172-180	2

: Is it correct to conclude thatthemaximum number of leaves are 153 mm long ? Why ?

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17. The following table gives the distribution of the life time of 400 neon lamps :

Life time (in hours)	Number of lamps (f_i)	Cumulative frequency
1500 – 2000	14	14 = 14
2000 – 2500	56	(14 + 56) = 70
2500 – 3000	60	(70 + 60) = 130
3000 – 3500	86	(130 + 86) = 216
3500 – 4000	74	(216 + 74) = 290
4000 – 4500	62	(290 + 62) = 352
4500 – 5000	48	(352 + 48) = 400
Total	$\Sigma f_i = n = 400$	

Find the median life time of a lamp.

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18. 100 surnames were randomly picked up from a local telephone directory and the

frequency distribution of the number of lettersin the English alphabetsin the surnames was obtained as follows :

Number of letters	1 – 4	4 – 7	7 – 10	10 – 13	13 – 16	16 – 19
Number of surnames	6	30	40	16	4	4

Determines the median number of letters in the surnames. Find the mean number of letters in the surnames? Aso, find the modal size of the surnames.

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19. The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	40 – 45	45 – 50	50 – 55	55 – 60	60 – 65	65 – 70	70 – 75
Number of students	2	3	8	6	6	3	2

20. During the medial check up of 35 students of a class, their weights were recorded as follows:

Weight (in kg)	Number of students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive for the given data.

Hence obtain the median weight from the graph and verify the result by using the formula.

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Exercise

1. In a city, the following weekly observations were made in a study of cost of living index for the year 1980-81.

Cost of Living Index	No. of weeks
140 – 150	5
150 – 160	10
160 – 170	18
170 – 180	9
180 – 190	6
190 – 200	4

Calculate the mean weekly cost of living index by a suitable method.

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2. The following table gives the distribution of total household expenditure (in Rs) of mannual workers in a city. Find the mean expenditure (in Rs) per household by using on approximate method.

Expenditure in ₹	100 –150	150 – 200	200 – 250	250 – 300	300 – 350	350 – 400	400 – 450	450 – 500
Frequency	24	40	33	28	30	22	16	7

What does mean signify?

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3. A frequency distribution of the life times of 400 T.V. Picture tubes tested in tube company is given below. Find the average life of tube ?

Life time (in ₹)	300 – 399	400 – 499	500 – 599	600 – 699	700 – 799	800 – 899	900 – 999	1000 –1099	1100 – 1199
No. of tubes	14	46	58	76	68	62	48	22	6

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4. Compute the missing frequencies f_1 and f_2 in the following data if the mean is $166\dfrac{9}{26}$ sum of observations is 52.

Class	140–150	150–160	160–170	170–180	180–190	190–200
Frequency	5	f_1	20	f_2	6	2

5. The arithmatic mean of the following data is 14, find the value of P.

x_i	5	10	15	20	25
f_1	7	P	8	4	5

6. The following table gives the distribution of different families on education. Find mean

expenditure on education of a family.

Expenditure (in ₹)	No. of families
1000 – 1500	24
1500 – 2000	40
2000 – 2500	33
2500 – 3000	28
3000 – 3500	30
3500 – 4000	22
4000 – 4500	16
4500 – 5000	7

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7. Find the value of P, if the arithmatic mean of

the following distribution is 53.

Classes	Frequency
0 – 20	12
20 – 40	15
40 – 60	32
60 – 80	P
80 – 100	13

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8. A candidate obtains the following percentage of marks in an examination :

English	Hindi	Mathematics	Physics	Chemistry
60	75	63	59	55

Find the weighted mean if weights 2, 1,5,5,3, are alloted to Eglish, Hidi Mathematics, Physics, Chemistry.

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9. The mean of the following frequency table is 50, but the frequency f_1 and f_2 in classes 20 - 40 and 60 -80 respectively are not known. Find these frequencies.

Class	Frequency
0 – 20	17
20 – 40	f_1
40 – 60	32
60 – 80	f_2
80 – 100	19
Total	120

10. If the mean of the following frequency distribution is 188. Find the missing frequencies f_1 x and f_2

Classes	0 – 80	80 – 160	160 – 240	240 – 320	320 – 400	Total
Frequency	20	25	f_1	f_2	10	100

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11. Find the mean age of 100 residents of a colony from the following data :

Age in year (greater than or equal to)	0	10	20	30	40	50	60	70
Number of Persons	100	90	75	50	25	15	5	0

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12. Find the mean marks by using assumed mean method secured by 140 students in statistics.

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
No. of students	20	24	40	36	20

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13. Find the mean marks of the following data :

Marks	No. of students
Below 10	5
Below 20	9
Below 30	17
Below 40	29
Below 50	45
Below 60	60
Below 70	70
Below 80	78
Below 90	83
Below 100	85

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14. Using step deviation method, calculate the mean of the following data :

Class interval	500 – 520	520 – 540	540 – 560	560 – 580	580 – 600
Frequency	14	9	5	4	3

15. Find the mean marks of the following cummulative frequency table :

Marks	No. of students
0 and above	80
10 and above	77
20 and above	72
30 and above	65
40 and above	55
50 and above	43
60 and above	28
70 and above	16
80 and above	10
90 and above	8
100 and above	0

16. If the mean of the following data is 20.6. Find the missing frequency (x).

x	f
10	3
15	10
20	x
25	7
35	5

17. The following table gives the enrollment in higher secondary school in 1978. Find the

mean enrolment per H.S. School.

Enrolment	No. of schools
20 – 39	526
40 – 59	620
60 – 79	674
80 – 99	717
100 – 119	681
120 – 139	612
140 – 159	540
160 – 179	517
180 – 199	552
Total	5439

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18. Find the mean of the following data using

deviation method :

Class interval	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
Frequency	10	25	28	12	10	15

19. Find the mean of the following data using deviation method :

Class interval	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Frequency	5	6	8	12	6	3

20. The table below gives the expenditure of distribution of female teachers in the primary schools of rural areas of various states and U.T.

of India. Find the mean percentage of female teachers by step deviation method.

% of female teachers	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75	75 – 85
Number of states/UT	6	11	7	4	4	2	1

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21. Find the mean marks from the following data :

Marks	No. of students
Below 10	3
Below 20	5
Below 30	9
Below 40	15
Below 50	20
Below 60	26
Below 70	34
Below 80	41
Below 90	45
Below 100	47

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22. Calculate the arithmetic mean of the following distribution.

Marks	No. of students
Less than 10	3
Less than 20	14
Less than 30	31
Less than 40	56
Less than 50	78
Less than 60	88
Lesst than 70	96
Less than 80	100

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23. Calculate the mean of the following :

Marks	No. of students
Above 60	0
Above 55	5
Above 50	11

Above 45	20
Above 40	40
Above 35	60
Above 30	70
Above 25	85
Above 20	90

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24. Find the mean of the following distribution

:

Class interval	Frquency
0-10	4
10-20	4
20-30	7
30-40	10
40-50	12
50-60	8
60-70	5

25. Find the mean of the following data :

Class-interval	Frequency
0 – 50	4
50 – 100	10
100 – 150	12
150 – 200	10
200 – 250	8
250 – 300	6
Total	50

26. Calculate the arithmetic mean of the following distribution

Class interval	Frequency
0 – 40	12
40 – 80	20
80 – 120	35
120 – 160	30
160 – 200	23

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27. Calculate the arithmetic mean for the following frequency distribution :

Class Interval	Frequency
0 – 80	22
80 – 160	35
160 – 240	44
240 – 320	25
320 – 400	24

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28. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a household :

Family Size	1–3	3–5	5–7	7–9	9–11
Number of families	7	8	2	2	1

Find the mode of this data.

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29. The following table shows the ages of the students during a year are :

Age (in years)	3 – 6	6 – 9	9 – 12	12 – 15	15 – 18	18 – 21
Number of students	2	5	10	23	21	12

Find the mode.

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30. The following table givesthe information on the observed lifetimes(in hours) of 215 electrical components.

Life time (in hours)	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35
Frequency	30	45	75	35	25

Determine the modal lifelines of the components.

31. Find the mode of the following distribution :

Rain (in cm)	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55
Number of Districts	10	12	8	20	11	4	5

32. Find the mode of the following distribution.

Monthly Salary. (in ₹)	10 – 15	15 – 20	20 – 25	25 –30	30 – 35	35 – 40	40 – 45
Number of Employees	3	7	16	12	9	5	3

33. Find the mode of the following distribution :

Size of House	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Number of families	25	36	180	89	32

34. Find the mode of the following distribution :

Life (hrs.)	0 - 400	400 – 800	800 – 1200	1200 – 1600	1600 – 2000	2000 – 2400	2400 – 2800	2800 – 3200
Frquency	4	12	40	41	27	13	9	4

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35. Find the mode of the following data:

X (Acre)	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
f :	20	45	80	55	40	38	5

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36. Find the mode of the following frquency distribution :

Salary (in ₹)	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50
Employees	22	45	67	73	85	190	64	55

37. Find the mode of the following distribution :

Marks	0 – 10	10 – 20	20– 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	5	15	20	20	32	14	14

38. Find the mode of the following distribution

:

x	Less than 5	5 – 10	10 15	15 – 20	more than 20
f	4	15	8	5	2

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39. A survey regarding the heigths (in cm) of 51

girls of Class X of a school was conducted and

the following data was obtained :

Height (in cm)	Number of girls
Less than 140	4
Less tthan 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

Find the median height.

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40. The median of the following data is 525.

Find the values of x and y, if the total

frequency is 100.

Class interval	Frequency
0 – 100	2
100 – 200	5
200 – 300	x
300 – 400	12
400 – 500	17
500 – 600	20
600 – 700	y
700 – 800	9
800 – 900	7
900 – 1000	4

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41. From the data of weight of 122 persons determine median .

Weight (in lbs.)	No. òf persons
0 – 10	3
10 – 20	6
20 – 30	20
30 – 40	32
40 – 50	33
50 – 60	17
60 – 70	8
70 – 80	3

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42. The annual profits earned by 30 shops of a shopping complex in a locality gives rise to following distribution.

Profit (in lakhs in ₹)	Number of shops (frequency)
More than or equal to 5	30
More than or equal to 10	28
More than or equal to 15	16
More than or equal to 20	14
More than or equal to 25	10
More than or equal to 30	7
More than or equal to 35	3

Draw both ogves for the data above. Hence obtain the median profit.

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43. On the basis of the following frequency distribution draw less than cumulative

frequency curve.

Weight (in kg.)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
No. of workers	5	8	10	4	7	4

44. Height of 50 plants in a garden were recorded and data is presented as below:

Height (in cm)	135 – 140	140 – 145	145 – 150	150 – 155	155 – 160	160 – 165
Number of plants	4	7	18	11	6	4

Draw 'less than' ogive and 'more than' ogive simultaneously on the same graph and find

the median of the data from graph. Also verify your result by using formula.

45. The following table shows the distribution of salaries of a group of workers :

Salary (in ₹)	20 – 40	40 – 60	60 –80	80 – 100	100 – 120	120 – 140	140 – 160
Workers	4	6	10	16	12	7	3

Determine cumulative frequencies

Draw the cumulative frequency curve i.e. less than ogive on a graph paper.

From graphs, write down the median salary (in Rs)?

46. Determine median-value of the following series using graphic method : (i.e., By less than ogive, By more than ogive approach)

Marks	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Frequency	4	8	12	19	11	10	5	3

47. Draw 'less than ogive' for the following data and determine median :

Age (under)	25	30	35	40	45	50	55	60
No. of workers	8	23	51	81	103	113	117	120

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48. Make a 'more than' cumulative frequency on the bases of no. of workers working in factories :

No. of workers	27 – 30	30 – 33	33 – 36	36 – 39	39 – 42	42 – 45	45–48
No. of factories	100	120	125	130	150	120	110

49. Draw less than ogive curve.

Income (in ₹)	260 – 280	280 – 300	300 – 320	320 – 340	340 – 360	360 – 380	380 – 400
No of families	4	10	4	1	1	2	2

50. Draw an ogive curve from the following data and find out : Median wage

Weekly wages (in ₹)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
No. of workers	3	6	20	32	33	17	8	3

51. Draw 'less than' cumulative frequency curve

on the basis of following distribution :

x	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
f	8	10	23	37	47	26	16	5

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52. Draw the cumulative frequency curve for

the following given data :

Class	0 – 30	30 – 60	60 – 90	90 – 120	120 – 150	150 – 180	180 – 210
Frequency	2	3	5	10	3	5	2

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53. Draw the less than cumulative frequency graph for he following data :

Height (in cm)	95 – 105	105 – 115	115 – 125	125 – 135	135 – 145
No. of people	19	23	36	70	25

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54. Draw the less than cummulative frequency graph for the following distribution giving 300 telephone calls according to the duration in

seconds.

Duration (in sec.)	0 – 30	30 – 60	60 – 90	90 – 120	120 – 150	150 – 180	180 – 210
Number of calls	9	17	43	82	81	44	24

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