Date: 29/9/2021

Q1. The marks obtained by 30 students of Class X of a certain school in a Mathematics paper consisting of 100 marks are presented in table below. Find the mean of the marks obtained by the students.

Marks obtained (x_i)	10	20	36	40	50	56	60	70	72	80	88	92	95
Number of student (f_i)	1	1	3	4	3	2	4	4	1	1	2	3	1

Q2. The wickets taken by a bowler in 10 cricket matches are as follows:

2   6   4   5   0   2   1   3   2   3

Find the mode of the data.

Q3. 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

Q4. The marks distribution of 30 students in a mathematics examination are given in Table 14.3 of Example 1. Find the mode of this data. Also, compare and interpret the mode and the mean.

Q5. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components:

Lifetime (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.

Q6. 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.

Q7. A student noted the number of cars passing through a spot on a road for 100 periods each of 3 minutes and summarised 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

Q8. The distribution below shows the number of wickets taken by bowlers in one-day cricket matches. Find the mean number of wickets by choosing a suitable method. What does the mean signify?

Number of wickets	20 - 60	60 - 100	100 - 150	150 - 250	250 - 350	350 - 450
Number of bowlers	7	5	16	12	2	3

Q9. The table below gives the percentage distribution of female teachers in the primary schools of rural areas of various states and union territories (U.T.) of India. Find the mean percentage of female teachers by all the three methods discussed in this section.

Percentage of female teachers	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75	75 – 85
Number of States/U.T.	6	11	7	4	4	2	1

Q10. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs. 18. Find the missing frequency f.

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

Q11. Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in Rs.)	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.

Q12. A survey was conducted by a group of students as a part of their environment awareness 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 house	1	2	1	5	6	2	3

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

Q13. 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

Q14. A survey regarding the heights (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 than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

Find the median height.

Q15. The annual profits earned by 30 shops of a shopping complex in a locality give rise to the following distribution:

Profit (in lakhs)	No 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 ogives for the data above. Hence obtain the median profit.

Q16. The table below shows the daily expenditure on food of 25 households in a locality.

Daily expenditure (in Rs.)	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.

Q17. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

Number of mangoes	50 – 52	53 – 55	56 – 58	59 – 61	62 – 64
Number of boxes	15	110	135	115	25

Find the mean number of mangoes kept in a packing box. Which method of finding the mean did you choose?

Q18. 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 mean heart beats per minute for these women, choosing a suitable method.

Number of hearts 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

Q19. To find out the concentration of SO_2 in the air (in parts per milion, *i.e.*, ppm), the data was collected for 30 localities in a certain city and is presented below:

Concentration of SO_2 (in ppm)	0.00 - 0.04	0.04 - 0.08	0.08 - 0.12	0.12 - 0.16	0.16 - 0.20	0.20 - 0.24
Frequency	4	9	9	2	4	2

Find the mean concentration of SO_2 in the air.

Q20. 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

Q21. 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

Q22. 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 Sates / 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

Q23. 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 mean monthly expenditure:

Expenditure (in Rs.)	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

Q24. The following table shows the ages of the patients admitted in a hospital during a year:

Age (in years)	5 – 15	15 – 25	25 – 35	35 – 45	45 – 55	55 - 65
Number of patients	6	11	21	23	14	5

Find the mode and the mean of the data given above. Compare and interpret the two measures of central tendency.

Q25. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate th median age, if policies are given only to persons having age 18 years onwards but less than 60 years.

Age (in years)	Number of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100

Q26. If the median of the distribution given below is 28.5, find the values of x and y.

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

Q27. 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 comsumtion (in units)	65 – 85	85 – 105	105 – 125	125 – 145	145 – 165	165 – 185	185 – 205
Number of consumers	4	5	13	20	14	8	4

Q28. The following table gives the distribution of the life time of 400 neon lamps:

Length (in mm)	Number of leaves
1500 – 2000	14
2000 – 2500	56
2500 – 3000	60
3000 – 3500	86
3500 – 4000	74
4000 – 4500	62
4500 – 5000	48

Find the median life time of a lamp.

Q29. The lengths of 40 leaves of a plant are measured correct to the nearest millimeters, and the data obtained 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

Find the median length of the leaves.

[Hint: The data needs to be converted to continuous classes for finding the median, since the formula assumes continuous classes. The classes then change to 117.5 – 125.5, 126.5 – 135.5, ..., 171.5 – 180.5]

Q30. 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

Q31. The following table gives production yield per henctare of wheat of 100 farms of a village.

Production yield (in kg/ha)	50 – 55	55 – 60	60 – 65	65 – 70	70 – 75	75 – 80
Number of farms	2	8	12	24	38	16

Change the distribution to a more than type distribution, and draw its ogive.

Q32. During the medical 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.

Q33. The following distribution gives the daily income of 50 workers of a factory.

Dalily income (in Rs.)	100 – 120	120 – 140	140 – 160	160 – 180	180 – 200
Number of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution, and draw its ogive.

Q34. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabets in the surnames was obtained as follows:

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

Determine the median number of letters in the surnames. Find the mean number of letters in the surnames? Also, find the modal size of the surnames.

S1. Mean = 59.3.

S2. Mode = $l + \left(\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$ = 2.

S3. Mode = 3.286.

S4. Mode = 52 and mean = 62.

S5. 65.625 hours.

S6. Mode = 4608.7 runs.

S7. Mode = 44.7 cars.

S8. Average = 152. 89.
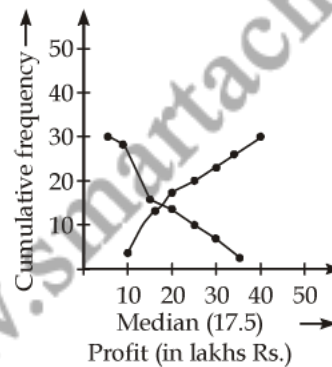
S9. Mean percentage = 39.71.
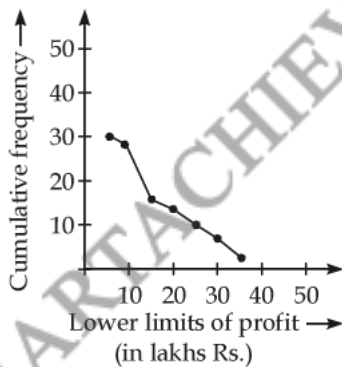
S10. f = 20.

S11. Rs. 145.20

S12. 8.1 plants. We have used direct method because numerical values of x_i and f_i are small.

S13. $x = 9, \quad y = 15$.

S14. Median height = 149.03.

S15. Median profit is Rs. 17.5

S16. Rs. 211.

S17. 57.19

S18. 75.9

S19. 0.099 ppm.

S20. 12.38 days.

S21. 69.43%.

S22. Mode : 30.6,   Mean = 29.2.

Most states/U.T. have a student teacher ratio of 30.6 and on and average, this ratio is 29.2.

S23. Modal monthly expenditure = Rs. 1847.83, Mean monthly expenditure = Rs. 2662.5.

S24. Mode = 36/8 years, Mean = 35.37 years. Maximum number of patients admitted in the hospital are of the ate 36.8 years (approx.), while on an average the age of a patient admitted to the hospital is 35.37 years.

S25. Median age = 35.76 years

S26. $x = 8$, $y = 7$.

S27. Median = 137 units,   Mean = 137.05 units,   Mode = 135.76 units.

The three measures are approximately the same in this case.

S28. Median life = 3406.98 hours.

S29. Median length = 146.75 mm.

S30. Median weight = 56.67 kg.

S31.

Production yield (in kg/ha)	Cumulative frequency
More than or equal to 50	100
More than or equal to 55	98
More than or equal to 60	90
More than or equal to 65	78
More than or equal to 70	54
More than or equal to 75	16

Now, draw the ogive by plotting the points: (50, 100), (55, 98), (60, 90), (65, 78), (70, 54) and (75, 16)

S32. Draw the ogive by plotting the points: (38, 0), (40, 3), (42, 5), (44, 9), (46, 14), (48, 28), (50, 32) and (52, (35).

Here, $\dfrac{n}{2} = 17.5$. Locate the point on the ogive whose ordinate is 17.5. The x-coordinate of this point will be the median.

S33.

Dalily income (in Rs.)	Cumulative frequency
Less than 120	12
Less than 140	26
Less than 160	34
Less than 180	40
Less than 200	50

Draw ogive by plotting the points: (120, 12), (140, 26), (160, 34), (180, 40) and (200, 50).

S34. Median 8.05;   Mean = 8.32;   Modal size = 7.88