

STATISTICS

1. The Arithmetic Mean of the following frequency distribution is 50. Find the value of p .

Classes	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	17	p	32	24	19

(CBSE 2005-06, 4 marks)

2. The following tables shows the monthly expenditure of a family. Draw a Pie for the data:

Item	Rent	Food	Clothing	Education	Misc.
Amount (In Rs.)	1500	3600	1200	2100	2400

(CBSE 2005-06, 4 marks)

3. If the mean of the following frequency distribution is 49, find the missing frequency p :

Class	Frequency
0 – 20	2
20 – 40	6
40 – 60	p
60 – 80	5
80 – 100	2

(CBSE 2006-07, 2 marks)

4. The expenditure (in rupees) of a family for a month is as follows:

Item	Rent	Food	Education	Electricity and Water	Others
Expenditure	800	3000	1200	400	1800

Represent the above data by a pie – chart

(CBSE 2006-07, 3 marks)

5. Find the class marks of classes 10 – 25 and 35 – 55.

(CBSE 2007-08, 1 mark)

6. Find mean, median and mode of the following data:

Classes	Frequency
0 – 20	6
20 – 40	8
40 – 60	10
60 – 80	12
80 – 100	6
100 – 120	5
120 – 140	3

(CBSE 2007-08, 6 marks)

7. Write the median class of the following distribution:

Classes

0 – 10
10 – 20
20 – 30
30 – 40
40 – 50
50 – 60
60 – 70

Frequency

4
4
8
10
12
8
4

(CBSE 2008-09, 1 mark)

The following table gives the daily income of 50 workers of a factory

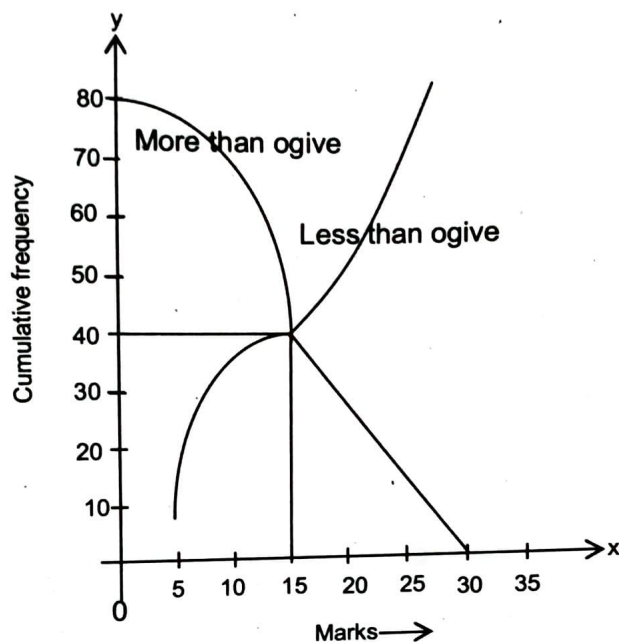
Daily income (in Rs.)	100 – 120	120 – 140	140 – 160	160 – 180	180 – 200
Number of workers	12	14	8	6	10

Find the Mean, Mode and Median of the above data.

(CBSE 2008-09, 6 marks)

In figure, the value of the median of the data using the graph of less than ogive and more than ogive is

(CBSE 2009-10, 1 mark)



- (A) 5
(C) 80

- (B) 40
(D) 15

10. Find the mean of the following frequency distribution:

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	8	12	10	11	9

(CBSE 2009-10, 2 marks)

11. Find the mode of the following data

Class	0 – 20	20 – 40	40 – 60	60 – 80
Frequency	15	6	18	10

(CBSE 2009-10, 2 marks)

12. The mean of the following frequency distribution is 50. Find the value of P.

Classes	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	17	28	32	P	19

(CBSE 2009-10, 3 marks)

13. Compute the median for the following cumulative frequency distribution

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

(CBSE 2009-10, 3 marks)

14. Find the missing frequency in the following frequency distribution table, if $N = 100$ and median is 32.

Marks obtained	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	Total
Number of students	10	?	25	30	?	10	100

(CBSE 2009-10, 3 marks)

15. The following table shows the ages of 100 persons of a locality.

Age (yrs)	Number of persons
0 – 10	5
10 – 20	15
20 – 30	20
30 – 40	23
40 – 50	17
50 – 60	11
60 – 70	9

Convert the given distribution to a 'less than' type cumulative frequency distribution and draw its ogive.
(CBSE 2009-10, 4 marks)

16. The mean and median of same data are 24 and 26 respectively. The value of mode is:
(A) 23 (B) 26
(C) 25 (D) 30
(CBSE 2010-11, 1 mark)

17. The ages of employees in a factory are as follows:

Age in years	17 – 23	23 – 29	29 – 35	35 – 41	41 – 47	47 – 58
Number of students	2	5	6	4	2	1

Find the median age group of employees.
(CBSE 2010-11, 2 marks)

18. The following is the daily pocket money spent by students.

Pocket money	0 – 15	15 – 30	30 – 45	45 – 60	60 – 75
Number of students	8	15	7	4	6

Find the mode of the data.
(CBSE 2010-11, 2 marks)

19. Find the mean of the following frequency distribution, using step deviation method.

Classes	100 – 50	150 – 200	200 – 250	250 – 300	300 – 250
Frequency	4	5	12	2	2

(CBSE 2010-11, 3 marks)

20. The mean of the following distribution is 22, find the missing frequency f :

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	12	16	6	F	9

(CBSE 2010-11, 3 marks)

21. Find the missing frequency f if the mode of the given data is 54.

Class:	120 – 130	130 – 140	140 – 150	150 – 160	160 – 170	170 – 180
Frequency	2	8	12	F	8	7

(CBSE 2010-11, 3 marks)

22. Compute the median for the following data:

Class interval	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	Less than 90	Less than 100
Cumulative	0	4	16	30	46	66	82	92	100

(CBSE 2010-11, 4 marks)

23. Write the empirical relationship between the three measures of central tendency.

(CBSE 2013-14, 1 mark)

24. Given below is a cumulative frequency distribution table showing daily income of 50 workers of a factory:

Daily Income (in Rs.)	More than or equal to 200	More than or equal to 300	More than or equal to 400	More than or equal to 500	More than or equal to 600
Number of workers	50	42	30	18	5

Draw cumulative frequency curve (ogive) of more than type for this data.

(CBSE 2013-14, 2 marks)

25. Heights of students of class X are given in the following frequency distribution:

Height (in cm)	150 – 155	155 – 160	160 – 165	165 – 170	170 – 175
Number of students	15	8	20	12	5

Find the modal height

(CBSE 2013-14, 3 marks)

26. A school conducted a test (of 100 marks) in English for students of class X. The marks obtained by students are shown in the following table:

Marks obtained	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90	90–100
Number of students	1	2	4	15	15	25	15	10	2	1

(CBSE 2013-14, 3 marks)

Find the modal marks.

27. The annual profits earned by shops of a particular shopping mall are given in the following distribution:

Profit (in lakh)	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50
Number of shops	4	8	15	20	25	18	12	7	3

Draw a 'less than type' ogive and a more than type ogive for this data. (CBSE 2013-14, 4 marks)

28. In a check up on heart beat rate of 50 females, it was found that median heart beat is 78. Find the missing frequencies f_1 and f_2 in the following frequency distribution.

Number of heart beats per minute	64 – 68	68 – 72	72 – 76	76 – 80	80 – 84	84 – 88	88 – 92
Number of females	4	5	f_1	f_2	9	7	1

(CBSE 2013-14, 4 marks)

29. Find the sum of upper limit and lower limit of the class interval in which the 20th observation of the following data lies:

Class interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700
Frequency	5	7	6	3	20	4	8

(CBSE 2014-15, 1 mark)

30. Determine missing frequency x, from the following data, when Mode is 67.

Class	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Frequency	5	x	15	12	7

(CBSE 2014-15, 2 marks)

31. The following data gives the information on the observed life times (in hours) of 150 electrical components:

Life time (in hours)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	15	10	35	50	40

Find the mode of the distribution.

(CBSE 2014-15, 3 marks)

32. The weekly pocket money of the students of class ix of a school are given in the following table:

Pocket money (in)	0 – 40	40 – 80	80 – 120	120 – 160	160 – 200	200 – 240
Number of students	5	7	15	10	5	8

Find the median for the above data.

(CBSE 2014-15, 3 marks)

33. The daily income of 150 families if given below. Calculate the arithmetic mean.

Income	No. of families
More than 75	150
More than 85	140
More than 95	115
More than 105	95
More than 115	70
More than 125	60
More than 135	40
More than 145	25

(CBSE 2014-15, 4 marks)

34. The following table gives the daily income of 50 workers of a factory. draw both types ("less than type" and "greater than type") cumulative frequency distribution and draw its ogive

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

(CBSE 2014-15, 4 marks)

35. The table below shows the salaries of 280 persons:

Salary (In thousand Rs.)

5 – 10
10 – 15
15 – 20
20 – 25
25 – 30
30 – 35
35 – 40
40 – 45
45 – 50

Number of Persons

49
133
63
15
6
7
4
2
1

Calculate the median salary of the data.

(CBSE 2017-18, 3 marks)

36. The mean of the following distribution is 18. Find the frequency f of the class 19 – 21.

Class	11 – 13	13 – 15	15 – 17	17 – 19	19 – 21	21 – 23	23 – 25
Frequency	3	6	9	13	f	5	4

OR
The following distribution gives the daily income of 50 workers of a factory:

Daily 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. (CBSE 2017-18, 4 marks)

37. Find the mode of the following frequency distribution

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	8	10	10	16	12	6	7

(CBSE 2018-19, 3 marks)

38. The arithmetic mean of the following frequency distribution is 53. Find the value of k .

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	12	15	32	k	13

(CBSE 2018-19, 3 marks)

39. If the median of the following frequency distribution is 32.5. Find the values of f_1 and f_2 .

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	Total
Frequency	f_1	5	9	12	f_2	3	2	40

OR

The marks obtained by 100 students of a class in an examination are given below.

Marks	No. of Students
0 – 5	2
5 – 10	5
10 – 15	6
15 – 20	8
20 – 25	10
25 – 30	25
30 – 35	20
35 – 40	18
40 – 45	4
45 – 50	6

Draw 'a less than' type cumulative frequency curves (ogive). Hence find median (CBSE 2018-19, 4 marks)

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

Daily Income (in Rs.)	200 – 220	220 – 240	240 – 260	260 – 280	280 – 300
Number of workers	12	14	8	6	10

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

OR

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

Daily expenditure	100 – 150	150 – 200	200 – 250	250 – 300	300 – 350
Number of households:	4	5	12	2	2

(CBSE 2018-19, 4 marks)

41. If the mean of first n natural number is 15, then find n . (CBSE 2019-20, 1 mark)

42. Find the mean of the following distribution:

Class:	3 – 5	5 – 7	7 – 9	9 – 11	11 – 13
Frequency	5	10	10	7	8

(CBSE 2019-20, 2 marks)

43. Find the mode of the following data:

Class:	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120	120 – 140
Frequency	6	8	10	12	6	5	3

(CBSE 2019-20, 2 marks)

44. The following table gives production yield per hectare (in quintals) of wheat of 100 farms of a village:

Production yield/hect.	40 – 45	45 – 50	50 – 55	55 – 60	60 – 65	65 – 70
Number of farms	4	6	16	20	30	24

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

(CBSE 2019-20, 4 marks)

45. The median of the following data is 525. Find the values of x and y , if total frequency is 100:

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

(CBSE 2019-20, 4 marks)

46. Find the mode of the following frequency distribution:

Class	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	15	10	12	17	4

(CBSE 2020-21, Term – II, 2 mark)

47. For what value of x , is the median of the following frequency distribution 34.5?

Class	Frequency
0 – 10	3
10 – 20	5
20 – 30	11
30 – 40	10
40 – 50	x
50 – 60	3
60 – 70	2

(CBSE 2020-21, Term – II, 2 mark)

48. Find the mode of the following frequency distribution:

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	8	7	12	5	3

(CBSE 2020-21, Term – II, 2 mark)

49. The frequency distribution given below shows the weight of 40 students of a class. Find the median weight of the students.

Weight (in kg)	Number of Students
40 – 45	9
45 – 50	5
50 – 55	8
55 – 60	9
60 – 65	6
65 – 70	3

(CBSE 2020-21, Term – II, 2 mark)

50. Find the mode of the following frequency distribution:

Class:	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency:	25	30	45	42	35

(CBSE 2020-21, Term – II, 2 mark)

51. Find mode of the following frequency distribution:

Class	100 – 110	110 – 120	120 – 130	130 – 140	140 – 150
Frequency	5	9	8	11	7

(CBSE 2020-21, Term – II, 2 mark)

52. Following is the daily expenditure on lunch by 30 employees of a company:

Daily Expenditure (in Rupees)	Number of Employees
100 – 120	8
120 – 140	3
140 – 160	8
160 – 180	6
180 – 200	5

Find the mean daily expenditure of the employees.

(CBSE 2020-21, Term – II, 3 mark)

53. The following table shows the age of patients admitted in a hospital during a particular week:

Age (in years)	5 – 15	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65
Number of Patients	5	12	20	24	15	4

Find the mean age of the patients.

(CBSE 2020-21, Term – II, 3 mark)

54. Find the mean of the following frequency distribution:

Class:	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35
Frequency:	4	10	5	6	5

(CBSE 2020-21, Term – II, 3 mark)

55. The median of following frequency distribution is 25. Find the value of x.

Class:	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency:	6	9	10	8	x

(CBSE 2020-21, Term – II, 3 mark)

56. The mileage (km/l) of 50 cars was recorded by a dealer and tabulated as given below:

Mileage (in km/l)	Number of Cars
10 – 12	13
12 – 14	18
14 – 16	10
16 – 18	7
18 – 20	2

Find mean of the above distribution.

(CBSE 2020-21, Term – II, 3 mark)

57. Determine median of the following frequency distribution:

Class	Frequency
15 – 20	8
20 – 25	13
25 – 30	21
30 – 35	12
35 – 40	5
40 – 45	4

(CBSE 2020-21, Term – II, 3 mark)

58. Using the empirical relationship between the three measures of central tendency, find the median of a distribution, whose mean is 169 and mode is 175. (CBSE 2021-22 TERM-II, 2 mark)

59. The frequency distribution table of agriculture holding in a village is given below:

Area of Land (in hectares)	1 – 3	3 – 5	5 – 7	7 – 9	9 – 11	11 – 13
Number of families	20	45	80	55	40	12

Find the modal agriculture holding per family.

(CBSE 2021-22 TERM-II, 2 mark)

60. Find the mode of the given frequency distribution:

Class	Frequency
15 – 25	6
25 – 35	11
35 – 45	22
45 – 55	23
55 – 65	14
65 – 75	5

(CBSE 2021-22, TERM-II, 2 mark)

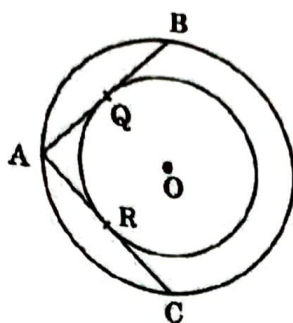
61. The mode of a grouped frequency distribution is 75 and the modal class is 65 – 80. The frequency of the class preceding the modal class is 6 and the frequency of the class succeeding the modal class is 8. Find the frequency of the modal class. (CBSE 2021-22, TERM-II, 2 mark)

62. Find the mean of the following frequency distribution:

Class	1 – 5	5 – 9	9 – 13	13 – 17
Frequency	4	8	7	6

(CBSE 2021-22, TERM-II, 2 mark)

63. In figure, there are two concentric circles with centre O. If ARC and AQB are tangents to the smaller circle from the point A lying on the larger circle, find the length of AC, if AQ = 5 cm.
(CBSE 2021-22, TERM-II, 2 mark)



64. If mode of the following frequency distribution is 55, then find the value of x.
Class: 0 – 15 15 – 30 30 – 45 45 – 60 60 – 75 75 – 90
Frequency: 10 7 x 15 10 12
 (CBSE 2021-22 TERM-II, 2 mark)

65. The weights (in kg) of 50 wild animals of a National Park were recorded and the following data was obtained:

Weight (in kg)	Number of animals
100 – 110	4
110 – 120	12
120 – 130	23
130 – 140	8
140 – 150	3

Find the mean weight (in kg) of animals, using assumed mean method.

(CBSE 2021-22, TERM-II, 3 mark)

66. For the following frequency distribution, find the median:

Class	Frequency
1400 – 1550	6
1550 – 1700	13
1700 – 1850	25
1850 – 2000	10

(CBSE 2021-22, TERM-II, 3 mark)

67. (a) The mean of the following frequency distribution is 25. Find the value of f.
Class: 0 – 10 10 – 20 20 – 30 30 – 40 40 – 50
Frequency: 5 18 15 f 6
 OR

- (b) Find the mean of the following data using assumed mean method:
Class: 0 – 5 5 – 10 10 – 15 15 – 20 20 – 25
Frequency: 8 7 10 13 12
 (CBSE 2021-22 TERM-II, 3 mark)

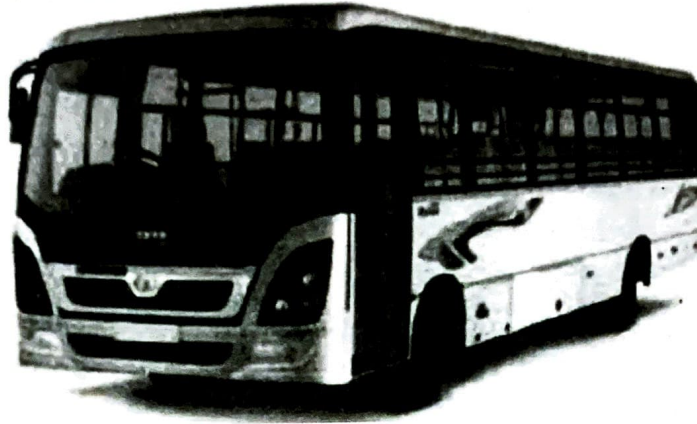
68. Heights of 50 students of class X of a school are recorded and following data is obtained:

Height (in cm):	130 – 135	135 – 140	140 – 145	145 – 150	150 – 155	155 – 160
Frequency:	4	11	12	7	10	6

Find the median height of the students.

(CBSE 2021-22, 3 mark)

69. **Case Study – 1:** Electric buses are becoming popular nowadays. These buses have the electricity stored in a battery. Electric buses have a range of approximately 280 km with just one charge. These buses are superior to diesel buses as they reduce brake wear and also reduce pollution. Transport department of a city wants to buy some electric buses for the city. So, the department wants to know the distance travelled by existing public transport buses in a day. The following data shows the distance travelled by 50 existing public transport buses in a day.



Daily distance travelled (in km)	100 – 120	120 – 140	140 – 160	160 – 180	180 – 200
Number of buses	12	14	8	6	10

- (a) Find the 'median' distance travelled by a bus.
 (b) Find the 'mean (average)' distance travelled by a bus. **(CBSE 2021-22 TERM-II, 4 mark)**

70. **Case Study-1:** Yoga is an ancient practice which is a form of meditation and exercise. By practising yoga, we not even make our body healthy but also achieve inner peace and calmness. The International Yoga Day is celebrated on 21st of June every year since 2015. To promote Yoga, Green Park society in Pune organised a 7-day Yoga camp in their society. The number of people of different age groups who enrolled for this camp is given as follows:

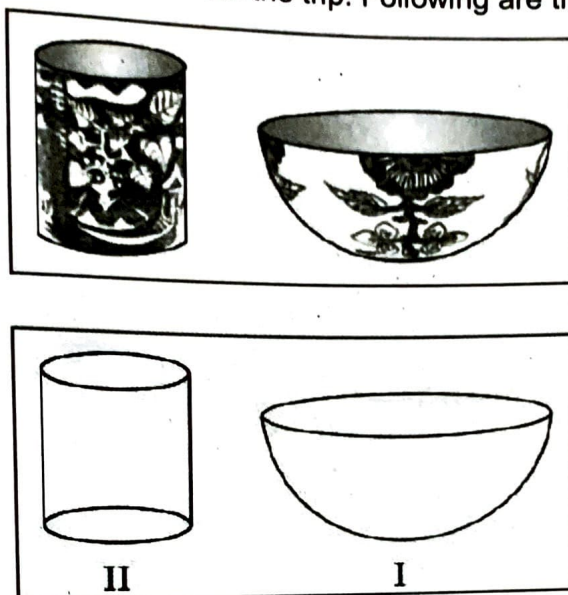


Age Group	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75	75 - 85
Number of People	8	10	15	25	40	24	18

Based on the above, find the following:

- (a) Find the median age of people enrolled for the camp.
 (b) If x more people of age group 65 – 75 had enrolled for the camp, the mean age would have been 58. Find the value of x . **(CBSE 2021-22, TERM-II, 4 mark)**

Case Study-2: Khurja is a city in the Indian state of Uttar Pradesh famous for the pottery. Khurja pottery is traditional Indian pottery work which has attracted Indians as well as foreigners with a variety of tea-sets, crockery and ceramic tile works. A huge portion of the ceramics used in the country is supplied by Khurja and is also referred as "The Ceramic Town". One of the private schools of Bulandshahr organised an Educational Tour for class 10 students to Khurja. Students were very excited about the trip. Following are the few pottery objects of Khurja.



Students found the shapes of the objects very interesting and they could easily relate them with mathematical shapes viz sphere, hemisphere, cylinder etc. Maths teacher who was accompanying the students asked following questions:

- (a) The internal radius of hemispherical bowl (filled completely with water) in I is 9 cm and radius and height of cylindrical jars in II is 1.5 cm and 4 cm respectively. If the hemispherical bowl is to be emptied in cylindrical jars, then how many cylindrical jars are required?
- (b) If in the cylindrical jar full of water, a conical funnel of same height and same diameter is immersed, then how much water will flow out of the jar? **(CBSE 2021-22, TERM-II, 4 mark)**

72. The distribution below gives the marks obtained by 80 students on a test:

Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60
Number of students	3	12	27	57	75	80

The modal class of this distribution is:

- (A) 10–20
(C) 30–40

- (B) 20–30
(D) 50–60

(CBSE 2022-23, 1 mark)

73. If the value of each observation of a statistical data is increased by 3, then the mean of the data

- (A) remains unchanged
(C) increases by 6

- (B) increases by 3
(D) increases by $3n$

(CBSE 2022-23, 1 mark)

74. The empirical relation between the mode, median and mean of a distribution is:

- (A) Mode = 3 Median – 2 Mean
(C) Mode = 2 Median – 3 Mean

- (B) Mode = 3 Mean – 2 Median
(D) Mode = 2 Mean – 3 Median

(CBSE 2022-23, 1 mark)

75. Median and Mode of a distribution are 25 and 21 respectively. Mean of the data using empirical relationship is:

(A) 27 (B) 29 (C) 18 (D) $\frac{29}{3}$
(CBSE 2022-23, 1 mark)

76. Find the mean and the median of the marks of 100 students of a class, given in the following table:

Marks	0-5	5-10	10-15	15-20	20-25	25-30
Number of Students	4	11	13	15	31	26

(CBSE 2022-23, 3 marks)

77. 250 apples of a box were weighted and the distribution of masses of the apples is given in the following table:

Mass(in grams)	80-100	100-120	120-140	140-160	160-180
Number of apples	20	60	70	x	60

- (i) Find the value of x and the mean mass of the apples.
(ii) Find the modal mass of the apples.

(CBSE 2022-23, 5 marks)

78. The monthly expenditure on milk in 200 families of a Housing Society is given below:

Monthly expenditure (in Rs.)	1000 – 1500	1500 – 2000	2000 – 2500	2500 – 3000	3000 – 3500	3500 – 4000	4000 – 4500	4500 – 5000
Number of families	24	40	33	X	30	22	16	7

Find the value of x and also, find the median and mean expenditure on milk.

(CBSE 2022-23, 5 marks)

79. India meteorological department observes seasonal and annual rainfall every year in different sub-divisions of our country?



It helps them to compare and analyse the results. The table given below shows sub-division wise seasonal (monsoon) rainfall (mm) in 2018:

Rainfall (mm)**Number of Sub-divisions**

200–400	2
400–600	4
600–800	7
800–1000	4
1000–1200	2
1200–1400	3
1400–1600	1
1600–1800	1

Based on the above information, answer the following questions:

- (I) Write the modal class.
 (II) Find the median of the given data.

1 mark
 2 marks

OR

Find the mean rainfall in this season.

- (III) If sub-division having at least 1000 mm rainfall during monsoon season is considered good rainfall sub-division, then how many sub-divisions had good rainfall?

1 mark

(CBSE 2022-23, 4 marks)

80. For some data $x_1, x_2, \dots, x_n$ with respective frequencies $f_1, f_2, \dots, f_n$, the value of $\sum_{i=1}^n f_i (x_i - \bar{x})$ is equal to:

(CBSE 2023-24, 1 Mark)

- (A) $n\bar{x}$
 (B) 1
 (C) $\sum f_i$
 (D) 0

81. The middle most observation of every data arranged in order is called:

(CBSE 2023-24, 1 Mark)

- (A) mode
 (B) median
 (C) mean
 (D) deviation

82. If value of each observation in a data is increased by 2, then median of the new data:

(CBSE 2023-24, 1 Mark)

- (A) increases by 2
 (B) increases by $2n$
 (C) remain same
 (D) decreases by 2

83. After an examination, a teacher wants to know the marks obtained by maximum number of the students in her class. She requires to calculate _____ of marks.

(CBSE 2023-24, 1 Mark)

- (A) median
 (B) mode
 (C) mean
 (D) range

84. The mean of five observations is 15. If the mean of first three observations is 14 and that of the last three observations is 17, then the third observation is:

(CBSE 2023-24, 1 Mark)

- (A) 20
 (B) 19
 (C) 18
 (D) 17

85. For the data 2, 9, $x + 6$, $2x + 3$, 5, 10, 5; if the mean is 7, then the value of x is:

(CBSE 2023-24, 1 Mark)

- (A) 9
 (B) 6
 (C) 5
 (D) 3

86. If the difference of mode and median of a data is 24, then the difference of its median and mean is:
(A) 12 (B) 24
(C) 8 (D) 36
(CBSE 2023-24, 1 Mark)

87. In a test, the marks obtained by 100 students (out of 50) are given below:

Number announced	0-10	10-20	20-30	30-40	40-50
Number of times (f)	12	23	34	25	6

Find the mean marks of the students.

(CBSE 2023-24, 3 Marks)

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

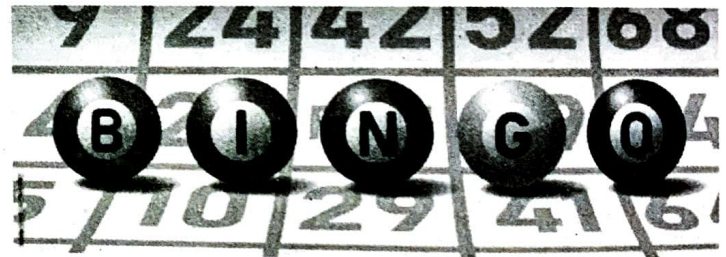
Age (in years)	15-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode and mean of the data given above.

(CBSE 2023-24, 5 Marks)

Case Study – 1

89. BINGO is game of chance. The host has 75 balls numbered 1 through 75. Each player has a BINGO card with some numbers written on it. The participant cancels the number on the card when called out a number written on the ball selected at random. Whosoever cancels all the numbers on his/her card, says BINGO and wins the game?



The table given below shows the data of one such game where 48 balls were used before Tara said 'BINGO'.

(CBSE 2023-24, 4 Marks)

Numbers announced	Number of times
0-15	8
15-30	9
30-45	10
45-60	12
60-75	9

Based on the above information, answer the following:

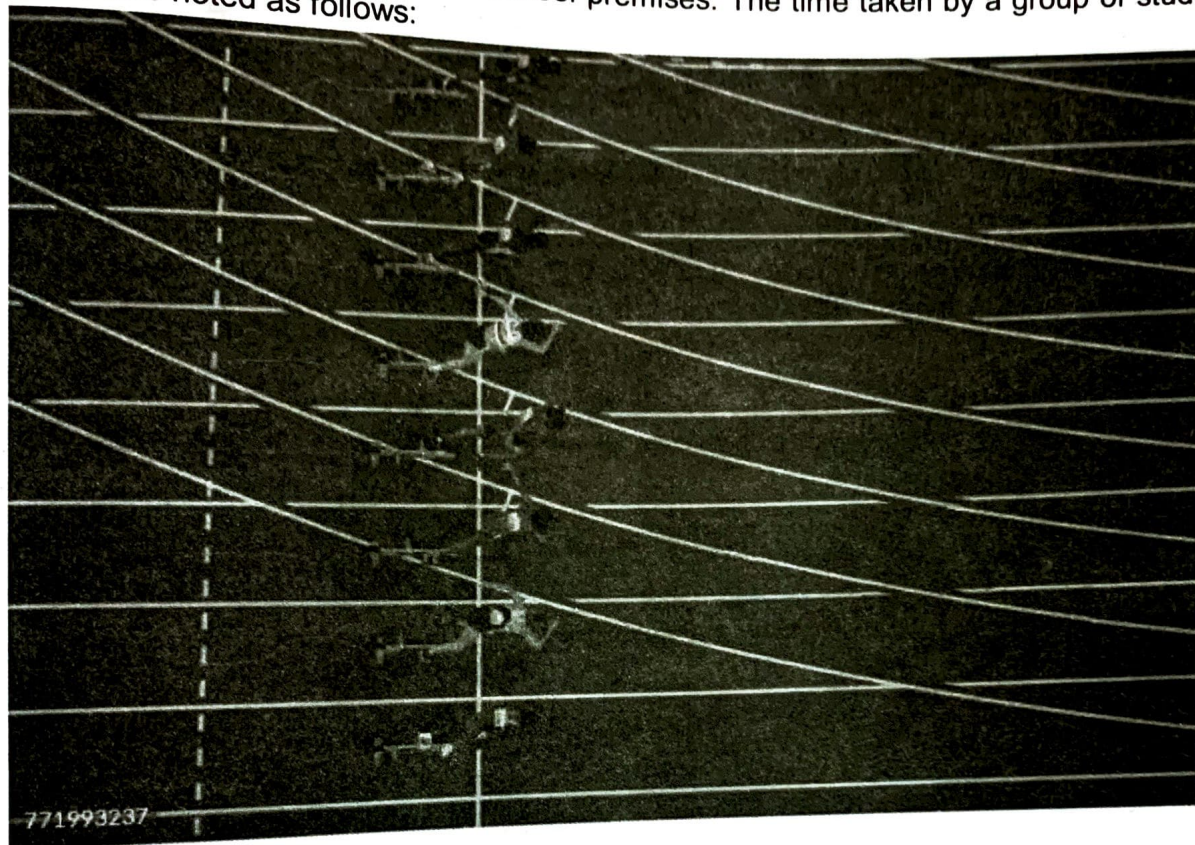
- Write the median class.
- When first ball was picked up, what was the probability of calling out an even number?
- (a) Find median of the given data.

OR

- Find mode of the given data.

90.

Activities like running or cycling reduce stress and the risk of mental disorders like depression. Running helps build endurance. Children develop stronger bones and muscles and are less prone to gain weight. The physical education teacher of a school has decided to conduct an inter school running tournament in his school premises. The time taken by a group of students to run 100 m, was noted as follows:



Time (in seconds)	0–20	20–40	40–60	60–80	80–100
Number of students	8	10	13	6	3

(CBSE 2023-24, 4 Marks)

Based on the above, answer the following questions:

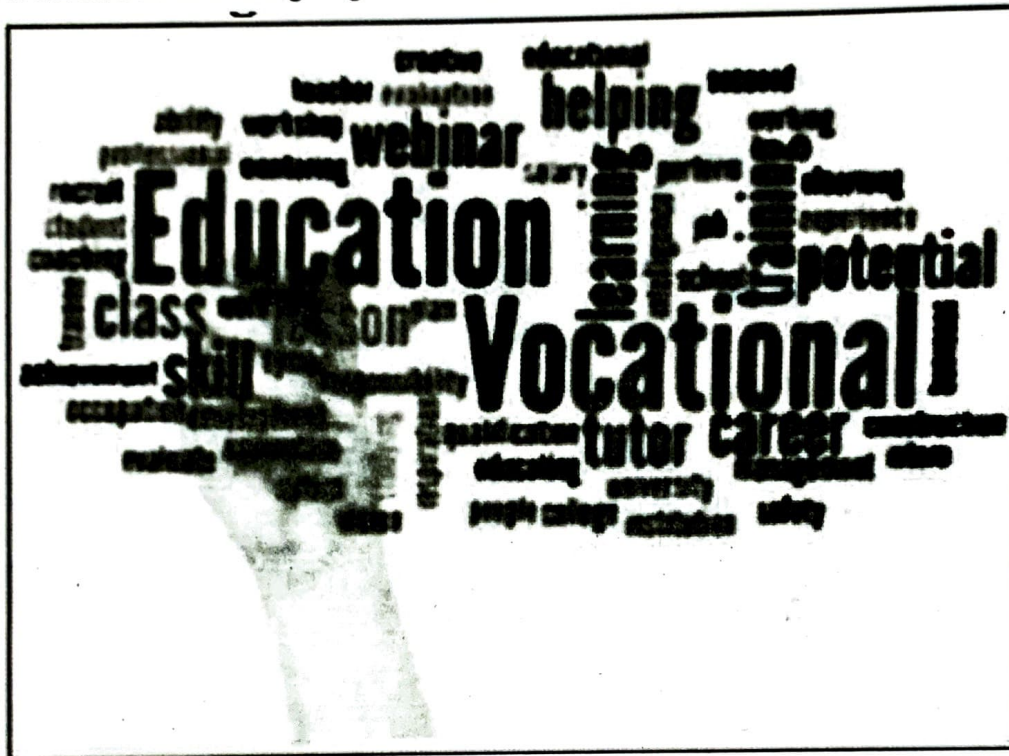
- What is the median class of the above given data?
- (a) Find the mean time taken by the students to finish the race.

OR

- Find the mode of the above given data.
- How many students took time less than 60 seconds?

Case Study – 3

91. Vocational training complements traditional education by providing practical skills and hands-on experience. While education equips individuals with a broad knowledge base, vocational training focuses on job-specific skills, enhancing employability thus making the student self-reliant. Keeping this in view, a teacher made the following table giving the frequency distribution of students/adults undergoing vocational training from the training institute.



Age (in years)	15–19	20 – 24	25 – 29	30 – 34	35 – 39	40 – 44	45 – 49	50 – 54
Number of participants	62	132	96	37	13	11	10	4

From the above, answer the following questions:

(CBSE 2023-24, 4 Marks)

- What is the lower limit of the modal class of the above data?
- (a) Find the median class of the above data.

OR

- Find the number of participants of age less than 50 years who undergo vocational training.
- Give the empirical relationship between mean, median and mode.