chapter - 13

Statistics

Previous Years Questions

13.1 Introduction

MCQ

1. If the value of each observation of a statistical data is increased by 3, then the mean of the data
   (a) remains unchanged
   (b) increase by 3
   (c) increases by 6
   (d) increase by $3n$

   (2023)

VSA (1 mark)

2. If the mean of the first n natural number, is 15, then find n.

   (2020)

3. If mean of 5 observations $x, x+2, x+4, x+6$ and $x+8$ is 11, then find the value of x.

   (Board Term I, 2015)

SA II (3 marks)

4. The mean weight of 150 students in a class is 60 kg. The mean weight of boys is 70 kg while that of girls is 55 kg. Find the number of boys and girls in the class. (Board Term I, 2016) An

13.2 Mean of Grouped Data

VSA (1 mark)

5. In the formula $\bar{x} = a + \left(\frac{\sum f_i u_i}{\sum f_i}\right) \times h, u_i =$

   (NCERT Exemplar, 2020)

SA I (2 marks)

6. Find the mean of the following distribution:

Class	$3-5$	$5-7$	$7-9$	$9-11$	$11-13$
Frequency	5	10	10	7	8

(2020)

7. If the mean of the following frequency distribution is 10.8, then find the value of p :

Class	$0-4$	$4-8$	$8-12$	$12-16$	$16-20$
Frequency	3	p	5	8	2

(Term II, 2021-22 C)

8. Data of 'missed catches' for the 40 matches played by a player is as follows:

Number of missed catches in a match	$0-3$	$3-6$	$6-9$	$9-12$	$12-15$
Number of matches	15	16	3	4	2

Calculate the mean number of catches missed by him.

(Board Term I, 2016)

SA II (3 marks)

9. Find the mean of the following frequency distribution:

Class	**Frequency**
$0-10$	12
$10-20$	18
$20-30$	27
$30-40$	20
$40-50$	17
$50-60$	6

(Term II, 2021-22)

10. 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.

(Term II, 2021-22)

11. 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

(Term II, 2021-22)

12. 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

(Term II, 2021-22)

13. 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

(Delhi 2019)

14. Find the mean of the following frequency distribution:

Class	$0-20$	$20-40$	$40-60$	$60-80$	$80-100$

Frequency	17	28	32	24	19

(AI 2019)

15. If the mean of the following distribution is 54, find the missing frequency x :

Class	$0-20$	$20-40$	$40-60$	$60-80$	$80-100$
Frequency	16	14	24	26	x

(Board Term-I, 2017)

16. Find the mean of the following distribution:

Class	$0-6$	$6-12$	$12-18$	$18-24$	$24-30$
Frequency	7	5	10	12	2

(Board Term I, 2017)

17. Find the mean of the data by step deviation method:

Class	$15-25$	$25-35$	$35-45$	$45-55$	$55-65$	$65-75$	$75-85$	$85-95$
Frequency	6	11	7	4	4	2	1	10

(Board Term I, 2017)

18. Find the mean of the following data:

Class intervals	**Frequency**
$0-20$	6
$20-40$	8
$40-60$	10

$60-80$	12
$80-100$	6
$100-120$	5
$120-140$	3

(Board Term I, 2017)

19. Calculate the mean for the following frequency distribution:

Class	$10-30$	$30-50$	$50-70$	$70-90$	$90-110$
Frequency	15	18	25	10	2

(Board Term I, 2016)

20. The following table gives the literacy rate (in %) in 40 cities. Find the mean literacy rate.

Literacy rate (in %)	$45-55$	$55-65$	$65-75$	$75-85$	$85-95$
Number of cities	4	11	12	9	4

(Board Term I, 2015)

LA (4/5 / 6 marks)

21. If the mean of the following frequency distribution is 62.8, then find the missing frequency x :

Class	$0-20$	$20-40$	$40-60$	$60-80$	$80-100$	$100-120$
Frequency	5	8	x	12	7	8

(2019 C)

22. 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

(2018)

13.3 Mode of Grouped Data

MCQ

23. 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
(b) $20-30$
(c) $30-40$
(d) $50-60$

(2023)

SA I (2 marks)

24. 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. (Term II, 2021-22) Ap

25. Find the missing frequency ' x ' of the following data, if its mode is 240:

Daily household expenditure (in ₹)	$0-100$	$100-200$	$200-300$	$300-400$	$400-500$

Number of families	140	230	270	x	150

(Term II, 2021-22 C)

26. Find the mode of the given frequency distribution.

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

(Term II, 2021-22)

27. 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

(Term II, 2021-22)

28. Find the mode of the following distribution :

Class	$10-15$	$15-20$	$20-25$	$25-30$	$30-35$	$35-40$
Frequency	45	30	75	20	35	15

(2020 C)

29. Find the mode of the following distribution:

Marks	$0-10$	$10-20$	$20-0$	$30-40$	$40-50$	$50-60$
Number of Students	4	6	7	12	5	6

30. 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

(2020)

31. Find the mode of the following data:

Marks	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

(Board Term I, 2015)

SA II (3 marks)

32. The weights of tea in 70 packets is given in the following table:

Weight (in g.)	**Number of packets**
200 – 201	12
201 – 202	26
202 – 203	20
203 – 204	9
204 – 205	2
205 – 206	1

Find the modal weight.

(2019 C)

33. The following table gives the literacy rate of 40 cities:

Literacy rate (in %)	$30-40$	$40-50$	$50-60$	$60-70$	$70-80$	$80-90$
Number of cities	6	7	10	6	8	3

Find the modal literacy rate.

(Board Term I, 2017)

34. The mode of the following data is 36. Find the missing frequency x in it.

Class	$0-10$	$10-20$	$20-30$	$30-40$	$40-50$	$50-60$	$60-70$
Frequency	8	10	x	16	12	6	7

(Board Term I, 2017)

LA (4/5 / 6 marks)

35. In a village, number of members in 50 families are given in the following frequency distribution:

Number of members	$1-3$	$3-5$	$5-7$	$7-9$	$9-11$	$11-13$	$13-15$	$15-17$	$17-19$
Number of families	2	8	6	10	5	5	7	4	3

Find the mode and mean of the above data.

(Board Term I, 2016)

13.4 Median of Grouped Data

MCQ

36. For the following distribution:

Class	$0-5$	$5-10$	$10-15$	$15-20$	$20-25$
Frequency	10	15	12	20	9

The sum of lower limits of median class and modal class is
(a) 15
(b) 25
(c) 30
(d) 35

(2023)

37. The mean and median of a distribution are 14 and 15 respectively. The value of mode is
(a) 16
(b) 17
(c) 13
(d) 18

(2020C)

VSA (1 mark)

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

(2021 C, Board Term I, 2017)

39. In a certain distribution, mean and median are 9.5 and 10 respectively. Find the mode of the distribution, using an empirical relation. (Board Term-I, 2017)

40. Find the mean of the data, using an empirical formula, when it is given that mode $= 50.5$ and median $= 45.5$.

(Board Term I, 2017)

41. Find the sum of upper limit and lower limit of the class interval in which the 20^{th} 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

(Board Term I, 2016)

SA I (2 marks)

42. In a class test, 50 students obtained marks are as follows. Find the modal class and the median class.

Marks	$0-20$	$20-40$	$40-60$	$60-80$	$80-100$
Number	4	6	25	10	5

(Board Term I, 2017)

43. The following table gives the literacy rate (in %) of 25 cities. Find the median class and modal class.

Literacy rate (in percent)	$50-60$	$60-70$	$70-80$	$80-90$
Number of cities	9	6	8	2

(Board Term I, 2017)

SA II (3 marks)

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

Class	$1400-1550$	$1550-1700$	$1700-1850$	$1850-2000$
Frequency	6	13	25	10

(Term II, 2021-22)

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

Height (in cm)	$130-135$	$135-140$	$140-145$	$145-150$	$150-155$	$155-160$
Number of students	4	11	12	7	10	6

Find the median height of the students.

(Term II, 2021-22)

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

Salary (In thousand)	**No. of Persons**
$5-10$	49
$10-15$	133
$15-20$	63
$20-25$	15
$25-30$	6
$30-35$	7
$35-40$	4
$40-45$	2
$45-50$	1

Calculate the median salary of the data.

(NCERT Exemplar, 2018)

47. Find the median of the following data:

Class Interval	$0-10$	$10-20$	$20-30$	$30-40$	$40-50$	Total
Frequency	8	16	36	34	6	100

(Board Term I, 2015)

LA (4/5 / 6 marks)

48. India meteorological department observe seasonal and annual rainfall every year in different subdivisions 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.

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?

(2023)

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

Monthly Expenditure (in ₹)	**Number of Students**
$1000 - 1500$	24
$1500 - 2000$	40
$2000 - 2500$	33
$2500 - 3000$	x
$3000 - 3500$	30
$3500 - 4000$	22
$4000 - 4500$	16
$4500 - 5000$	7

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

(2023)

50. Health insurance is an agreement whereby the insurance company agrees to undertake a guarantee of compensation for medical expenses in case the insured falls ill or meets with an accident which leads to hospitalisation of the insured. The government also promotes health insurance by providing a deduction from income tax.

An SBI health insurance agent found the following data for distribution of ages of 100 policy holders. The
health insurance policies are given to persons having age 15 years and onwards but less than 60 years.

Age (in years)	**Number of Policy Holders**
$15 - 20$	2

$20 - 25$	4
$25 - 30$	18
$30 - 35$	21
$35 - 40$	33
$40 - 45$	11
$45 - 50$	3
$50 - 55$	6
$55 - 60$	2

(i) Find the modal age of the policy holders.

(ii) Find the median age of the policy holders.

(Term II, 2021-22 C)

51. During the annual sports meet in a school, all the athletes were very enthusiastic. They all wanted to be the winner so that their house could stand first. The instructor noted down the time taken by a group of students to complete a certain race. The data recorded is given below:

Time (in sec)	$0 - 20$	$20 - 40$	$40 - 60$	$60 - 80$	$80 - 100$
Number of students	1	4	3	7	5

Based on the above, answer the following questions:

(i) What is the class mark of the modal class?
(a) 60
(b) 70
(c) 80
(d) 140

(ii) The mode of the given data is
(a) 70.33
(b) 71.33
(c) 72.33
(d) 73.33

(iii) The median class of the given data is
(a) $20-40$
(b) $40-60$
(c) $80-100$
(d) $60-80$

(iv) The sum of the lower limits of median class and modal class is 1
(a) 80
(b) 140
(c) 120
(d) 100

(v) The median time (in seconds) of the given data is
(a) $65 \cdot 7$
(b) $85 \cdot 7$
(c) $45 \cdot 7$
(d) 25.7

(2021C)

52. The distribution given below shows the number of wickets taken by bowlers in one-day cricket matches. Find the mean and the median of the number of wickets taken.

Number of wickets	**Number of bowlers**
$20-60$	7
$60-100$	5
$100-140$	16
$140-180$	12
$180-220$	2
$220-260$	3

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

Class	**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

(NCERT, 2020)

54. If the median of the following frequency distribution is 32.5, find the values of f_1 and f_2.

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

(Delhi 2019)

55. Find the values of frequencies x and y in the following frequency distribution table, if $N = 100$ and median is 32.

Marks	**No. of students**
$0 - 10$	10
$10 - 20$	x

$20-30$	25
$30-40$	30
$40-50$	y
$50-60$	10
Total	100

(AI 2019)

56. In an apple orchard, the number of apples on 80 trees are as follows:

Number of apples	$40-60$	$60-80$	$80-100$	$100-120$	$120-140$	$140-160$	$160-180$
Number of trees	12	11	14	16	13	9	5

Find the mode and median of the above data.

(Board Term I, 2017)

57. If the median of the following distribution is 46, find the missing frequencies p and q.

Class interval	$10-20$	$20-30$	$30-40$	$40-50$	$50-60$	$60-70$	$70-80$	Total
Frequency	12	30	p	65	q	25	18	230

(Board Term I, 2017)

58. If the median of the distribution given below is 27. Find the value of x and y.

Class Interval	$0-10$	$10-20$	$20-30$	$30-40$	$40-50$	$50-60$	Total
Frequency	5	x	20	14	y	8	68

(Board Term I, 2015)