

# STATISTICS

## OBJECTIVE SECTION

[BASIC/STANDARD]

### I. MULTIPLE CHOICE QUESTIONS

1. Construction of a cumulative frequency table is useful in determining the :

- (a) mean (b) median  
(c) mode (d) all the above three measures

2. In the following distribution.

| Monthly income (in ₹) | more than ₹ 10000 | more than ₹ 13000 | more than ₹ 16000 | more than ₹ 19000 | more than ₹ 22000 | more than ₹ 25000 |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Number of families    | 100               | 85                | 69                | 50                | 33                | 15                |

Find the number of families having income range (in ₹) 16000 – 19000.

- (a) 15 (b) 16 (c) 17 (d) 19

3. Consider the following frequency distribution of the heights of 60 students of a class.

| Height (in cm)  | 150-155 | 155-160 | 160-165 | 165-170 | 170-175 | 175-180 |
|-----------------|---------|---------|---------|---------|---------|---------|
| No. of students | 15      | 13      | 10      | 8       | 9       | 5       |

The sum of the lower limit of the modal class and upper limit of the median class is :

- (a) 310 (b) 315 (c) 320 (d) 330

4. Consider the data.

| Class     | 65-85 | 85-105 | 105-125 | 125-145 | 145-165 | 165-185 | 185-205 |
|-----------|-------|--------|---------|---------|---------|---------|---------|
| Frequency | 4     | 5      | 13      | 20      | 14      | 7       | 4       |

The difference of the upper limit of the median class and the lower limit to the modal class is :

- (a) 0 (b) 19 (c) 20 (d) 38

5. The times in seconds, taken by 150 athletes to run a 110 m hurdle race are tabulated below :

|                  |         |         |           |           |           |         |
|------------------|---------|---------|-----------|-----------|-----------|---------|
| <b>Class</b>     | 13.8-14 | 14-14.2 | 14.2-14.4 | 14.4-14.6 | 14.6-14.8 | 14.8-15 |
| <b>Frequency</b> | 2       | 4       | 5         | 71        | 48        | 20      |

The number of athletes who completed the race in or equal to 14.6 seconds is :

(a) 11 (b) 71 (c) 82 (d) 130

6. The abscissa of the point of intersection of the less than type and of the more than type cumulative frequency curves of a grouped data gives its :

(a) mean (b) median  
(c) mode (d) all the above

7. For the following distribution the sum of lower limit of the median class and modal class is :

|                  |     |      |       |       |       |
|------------------|-----|------|-------|-------|-------|
| <b>Class</b>     | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 |
| <b>Frequency</b> | 10  | 15   | 12    | 20    | 9     |

(a) 15 (b) 25 (c) 30 (d) 35

8. Consider the following frequency distribution.

|                  |     |      |       |       |       |
|------------------|-----|------|-------|-------|-------|
| <b>Class</b>     | 0-5 | 6-11 | 12-17 | 18-23 | 24-29 |
| <b>Frequency</b> | 13  | 10   | 15    | 8     | 11    |

The upper limit of the median class is

(a) 17 (b) 17.5 (c) 18 (d) 18.5

9. For the following distribution, the modal class is.

|                           |          |          |          |          |          |          |
|---------------------------|----------|----------|----------|----------|----------|----------|
| <b>Marks</b>              | Below 10 | Below 20 | Below 30 | Below 40 | Below 50 | Below 60 |
| <b>Number of students</b> | 3        | 12       | 27       | 57       | 75       | 80       |

(a) 10-20 (b) 20-30 (c) 30-40 (d) 50-60

10. In the formula  $\bar{x} = A + \frac{\sum f_i d_i}{\sum f_i}$

for finding the mean of a grouped data,  $d_i$ 's are deviations from :

(a) lower limits of the classes (b) upper limits of the classes  
(c) mid points of the classes (d) frequencies of the class marks

11. While computing mean of grouped data, we assume that the frequencies are :

(a) evenly distributed over all the classes  
(b) centred at the classmarks of the classes  
(c) centred at the upper limits of the classes  
(d) centred at the lower limits of the classes

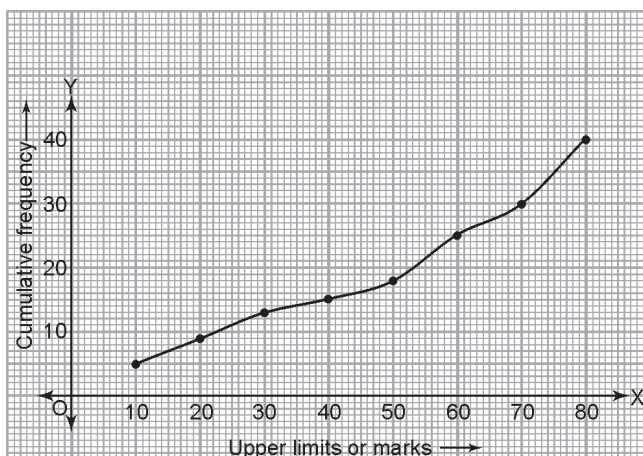
12. If  $x_i$ 's are the mid points of the class intervals of grouped data,  $f_i$ 's are the corresponding frequencies and  $\bar{x}$  is the mean, then  $\Sigma(f_i x_i - \bar{x})$  is equal to :

(a) 0 (b) -1 (c) 1 (d) 2

13. In the formula  $\bar{x} = a + h \left( \frac{\Sigma f_i u_i}{\Sigma f_i} \right)$  for finding the mean of a grouped frequency distribution,  $u_i$  is :

(a)  $\frac{x_i + a}{h}$  (b)  $h(x_i - A)$  (c)  $\frac{x_i - a}{h}$  (d)  $\frac{a - x_i}{h}$

14. A student draws a cumulative frequency curve for the marks obtained by 40 students of a class as shown. The median marks obtained by the students of the class are :



(a) 55 (b) 65 (c) 50 (d) 60

15. Construction of a cumulative frequency table is useful in determining the :

(a) mean (b) mode (c) median (d) none

16. The abscissa of the point of intersection of the less than type and of the more than type cumulative frequency curve of a grouped data gives.

(a) mode (b) median (c) mean (d) None of these

17. What is the Modal class in the given table

|      |       |       |       |       |
|------|-------|-------|-------|-------|
| 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| 6    | 8     | 13    | 11    | 9     |

(a) 0-10 (b) 20-30 (c) 30-40 (d) 40-50

18. What should be in the blank?  $2 \text{ Mean} = 3 \text{ Median} - (\quad)$ .

(a) 4 mode (b) mode (c) 2 mode (d) 3 mode

19. If each observation of the data is increased by 5, then what happens to its mean?

(a) is increased by 4 (b) is increased by 5  
(c) is decreased by 4 (d) is decreased by 5

20. What is the median of the data 78, 56, 22, 34, 45, 54, 39, 68, 54, 84?

(a) 54 (b) 53 (c) 55 (d) 51

21. If the mean of  $x$ ,  $x + 3$ ,  $x + 5$ ,  $x + 7$  and  $x + 10$  is 9, then find the mean of last three

observations is :

- (a)  $9\frac{4}{5}$  (b)  $10\frac{1}{2}$  (c)  $11\frac{1}{3}$  (d) 12

22. If the mean of  $n$  observations  $x_1, x_2, x_3, \dots, x_n$  is  $\bar{x}$ , then what is  $\sum_{i=1}^n (x_i - \bar{x}) =$

- (a) 0 (b) 1 (c) 2 (d) -1

23. For a frequency distribution, mean, median and mode are connected by the relationship

- (a)  $2 \text{ Mean} = 3 \text{ Median} - \text{Mode}$  (b)  $2 \text{ Mode} = \text{Median} - \text{Mean}$   
 (c)  $\text{Mode} = 2 \text{ Mean} - 3 \text{ Median}$  (d)  $3 \text{ Median} = 2 \text{ Mode} + \text{Mean}$

24. The class mark of a class interval is

- (a)  $\text{Upper limit} + \text{Lower limit}$  (b)  $\text{Upper limit} - \text{Lower limit}$   
 (c)  $\frac{\text{Upper limit} + \text{Lower limit}}{2}$  (d)  $\frac{\text{Upper limit} - \text{Lower limit}}{2}$

25. For the following distribution, the median class is

| Mobility consumption | Below 85 | Below 105 | Below 125 | Below 145 | Below 165 | Below 185 | Below 205 |
|----------------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| No. of consumers     | 4        | 9         | 22        | 42        | 56        | 64        | 68        |

- (a) 85-105 (b) 125-145 (c) 145-165 (d) 185-205

26. The wickets taken by a bowler in 12 cricket matches are as follows :

3, 7, 4, 6, 0, 6, 1, 3, 2, 3, 4, 5. The Mode of the data is

- (a) 4 (b) 3 (c) 2 (d) 1

27. The modal class in the given frequency table is :

| Class     | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|-----------|------|-------|-------|-------|-------|
| Frequency | 6    | 10    | 12    | 8     | 7     |

- (a) 0-10 (b) 20-30 (c) 30-40 (d) none of these

28. The mode of the following data is :

| Marks     | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
|-----------|-------|-------|-------|-------|--------|
| Frequency | 3     | 12    | 32    | 20    | 6      |

- (a) 73.25 (b) 75.25 (c) 76.25 (d) 78.25

29. The median class of the following data is :

| Marks           | Below 20 | Below 40 | Below 60 | Below 80 | Below 100 |
|-----------------|----------|----------|----------|----------|-----------|
| No. of Students | 17       | 22       | 29       | 37       | 50        |

- (a) 20-40 (b) 40-60 (c) 60-80 (d) 80-100

30. The maximum bowling speeds, in km/hr of 33 players at a cricket coaching centre are given below :

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| Speed (km/hr)  | 85-100 | 100-115 | 115-130 | 130-145 |
|----------------|--------|---------|---------|---------|
| No. of Players | 11     | 9       | 8       | 3       |

The median bowling speed is :

(a) 105.5 km/hr (b) 106.5 km/hr (c) 107.5 km/hr (d) 108.9 km/hr

31. The median of the following data is :

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|          |   |   |   |    |   |    |    |
|----------|---|---|---|----|---|----|----|
| <b>x</b> | 6 | 5 | 8 | 10 | 7 | 12 | 15 |
| <b>f</b> | 4 | 2 | 6 | 5  | 8 | 3  | 9  |

(a) 5 (b) 6 (c) 8 (d) 10

32. If the mean of the following distribution is 22, then the value of  $f$  is :

|                  |      |       |       |       |       |
|------------------|------|-------|-------|-------|-------|
| <b>Class</b>     | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| <b>Frequency</b> | 12   | 16    | 6     | $f$   | 9     |

(a) 5 (b) 6 (c) 7 (d) 9

33. The arithmetic mean of the following distribution is 25. The value of  $p$  is :

|                  |      |       |       |       |       |
|------------------|------|-------|-------|-------|-------|
| <b>Class</b>     | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| <b>Frequency</b> | 5    | 18    | 15    | $p$   | 6     |

(a) 9 (b) 13 (c) 15 (d) 16

34. The mean of the following data is :

|                  |     |     |     |     |      |
|------------------|-----|-----|-----|-----|------|
| <b>Class</b>     | 1-3 | 3-5 | 5-7 | 7-9 | 9-11 |
| <b>Frequency</b> | 7   | 8   | 2   | 2   | 1    |

(a) 2.3 (b) 3.2 (c) 4.1 (d) 4.2

35. The mean of the following data is

|                  |      |       |       |       |       |
|------------------|------|-------|-------|-------|-------|
| <b>Classes</b>   | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| <b>Frequency</b> | 7    | 8     | 15    | 9     | 10    |

(a) 25.23 (b) 26.32 (c) 26.43 (d) 26.75

36. If the median of the data : 24, 25, 26,  $x + 2$ ,  $x + 3$ , 30, 31, 34 is 27.5, then the value of  $x$  is :

(a) 25 (b) 27 (c) 28 (d) 30

37. The median of a given frequency distribution is found graphically with the help of

- (a) frequency curve (b) frequency polygon  
(c) histogram (d) an ogive

38. If the mode of some data is 7 and their mean is also 7, then their median is :

(a) 10 (b) 9 (c) 8 (d) 7

39. The mean of 11 observations is 30. If the mean of the first 6 observations is 28 and that of the last 6 observations is 32, then the 6th number is :

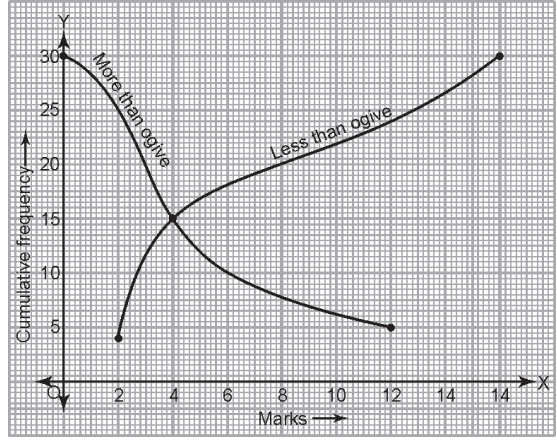
(a) 29 (b) 31 (c) 35 (d) 38

40. The median of the following observations given in order

16, 18, 20,  $24 - x$ ,  $22 + 2x$ , 28, 30, 32 is 24. The value of  $x$  is :

- (a) 5 (b) 4 (c) 2 (d) 1

41. Using the graph in the figure of 'less than ogive' and 'more than ogive', the median of the data is :



- (a) 18 (b) 20 (c) 4 (d) 17

42. Weights of 40 eggs were recorded as given below :

| Weights (in gms) | 85-89 | 90-94 | 95-99 | 100-104 | 105-109 |
|------------------|-------|-------|-------|---------|---------|
| No. of eggs      | 10    | 12    | 12    | 4       | 2       |

The lower limit of the median class is :

- (a) 90 (b) 95 (c) 92.5 (d) 95.5

43. Consider the following frequency distribution of the heights of 60 students of a class.

| Height (in cm)  | 150-155 | 155-160 | 160-165 | 165-170 | 170-175 |
|-----------------|---------|---------|---------|---------|---------|
| No. of students | 15      | 10      | 8       | 9       | 5       |

The upper limit of the median class in the given data is [CBSE(SP) 2019]

- (a) 165 (b) 155 (c) 160 (d) 170

44. The frequency distribution table of agricultural holdings in a village is given below :

| Area of land (hectares) | 1-3 | 3-5 | 5-7 | 7-9 | 9-11 | 11-13 |
|-------------------------|-----|-----|-----|-----|------|-------|
| No. of families         | 20  | 45  | 80  | 55  | 40   | 12    |

The modal agricultural holdings of the village is :

- (a) 5.8 (b) 4.7 (c) 6.2 (d) 7.5 [NCERT]

45. The daily income of a sample of 50 employees are tabulated as follows :

| Income (in ₹) | 1-200 | 201-400 | 401-600 | 601-800 |
|---------------|-------|---------|---------|---------|
|---------------|-------|---------|---------|---------|

| No. of employees | 14 | 15 | 14 | 7 |
|------------------|----|----|----|---|
|------------------|----|----|----|---|

The means daily income of employees =

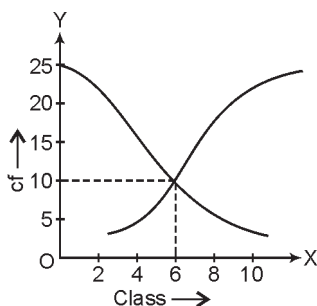
- (a) ₹ 356 (b) ₹ 456.8 (c) ₹ 259.8 (d) ₹ 532.7

[NCERT (EP)]

46. The mean of 10 numbers is 30. If every number is multiplied by 2, then the new mean =  
(a) 72 (b) 69 (c) 60 (d) 76
47. In a class of 25 students, 15 are boys. The mean weight of boys is 50 kg and that of girls is 45 kg. The mean weight of the class is  
(a) 356 kg (b) 40 kg (c) 52 kg (d) 56 kg
48. The mean of first  $n$  natural numbers is :  
(a)  $\frac{n(n+1)}{2}$  (b)  $n(n+1)$  (c)  $\frac{n+1}{2}$  (d)  $n+1$

## II. FILL IN THE BLANKS

- The median of the following data : 13, 15, 11, 12, 14, 16, 10, 12, 12, 13 is \_\_\_\_\_.
- Measures of central tendency that can be determined graphically is \_\_\_\_\_.
- Empirical relation between mean, mode and median is \_\_\_\_\_.
- The value of the median of the data using the following graph is \_\_\_\_\_.



- The median of first 10 prime numbers is \_\_\_\_\_.
- If the mode of the data : 16, 15, 17, 16, 15,  $x$ , 19, 17, 14 is 15, then  $x =$  \_\_\_\_\_.
- The median of first 3 composite numbers is \_\_\_\_\_.
- If the mean of 3, 4,  $x$ , 7, 8,  $y$  is 10, then  $x + y =$  \_\_\_\_\_.
- If 35 is removed from the data : 30, 34, 35, 36, 37, 38, 39, 40, then the median increases by \_\_\_\_\_.
- We can draw \_\_\_\_\_ types of ogives.

## III. VERY SHORT ANSWER QUESTIONS

- The mean of a set of numbers is  $\bar{x}$ . If each number is divided by 3, then find the new

mean.

- The mean of 8 observations is 10 and 4 is the mean of a set of 7 observations. Find the mean of the combined set.
- What is the most frequent value of a data called?
- Find the class mark of a class interval  $a - b$ .
- In the formula  $\bar{x} = a + h \left( \frac{\sum f_i u_i}{\sum f_i} \right)$ , for finding the mean, of grouped frequency distribution, what is  $u_i$ ?
- Write the formula for finding the mode of a grouped frequency distribution.
- If mode = 80, and median = 110, then find the median.
- A data has 25 observations (arranged in descending order. Which observation represents the median?
- Which measure of central tendency is given by the  $x$ -coordinate of the point of intersection of the more than ogive and less than ogive?
- A less than ogive is an upward curve and a more than ogive is a downward curve. Is it true?

### ANSWERS

#### I. Multiple Choice Questions :

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (b)  | 2. (d)  | 3. (b)  | 4. (c)  | 5. (c)  | 6. (b)  |
| 7. (b)  | 8. (b)  | 9. (c)  | 10. (c) | 11. (b) | 12. (a) |
| 13. (c) | 14. (a) | 15. (c) | 16. (b) | 17. (b) | 18. (b) |
| 19. (b) | 20. (a) | 21. (c) | 22. (a) | 23. (a) | 24. (c) |
| 25. (b) | 26. (b) | 27. (b) | 28. (c) | 29. (b) | 30. (c) |
| 31. (c) | 32. (c) | 33. (d) | 34. (d) | 35. (c) | 36. (a) |
| 37. (d) | 38. (d) | 39. (a) | 40. (c) | 41. (c) | 42. (a) |
| 43. (a) | 44. (c) | 45. (a) | 46. (c) | 47. (a) | 48. (c) |

#### II. Fill in the Blanks :

- |         |           |                             |        |       |
|---------|-----------|-----------------------------|--------|-------|
| 1. 12.5 | 2. Median | 3. Mode = 3 Median – 2 Mean | 4. 6   | 5. 12 |
| 6. 15   | 7. 6      | 8. 38                       | 9. 0.5 | 10. 2 |

#### III. Very Short Answer Questions.

- |                                                                     |        |         |                    |                        |
|---------------------------------------------------------------------|--------|---------|--------------------|------------------------|
| 1. $\frac{\bar{x}}{3}$                                              | 2. 7.2 | 3. Mode | 4. $\frac{a+b}{2}$ | 5. $\frac{x_i - a}{h}$ |
| 6. $l + \left( \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$ | 7. 125 | 8. 13th | 9. Median          |                        |
10. yes