



MATHS

BOOKS - S CHAND MATHS (ENGLISH)

STATISTICS

Example

1. If the mean of x_1, x_2 is 7.5 and the mean of x_1, x_2, x_3 is 8, then the value of x_3 is

A. A. 9

B. B. 8

C. C. 7.5

D. D. 6

Answer: A



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2. In a data 10 numbers are arranged in ascending order. If the 8th entry is increased by 6 the median increases by

A. 6

B. 3

C. 2

D. 0

Answer: D



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3. The mean deviation of the data 1,3,7,9,10,12 from the mean is

A. $\frac{10}{3}$

B. $\frac{19}{6}$

C. $\frac{21}{6}$

D. $\frac{17}{6}$

Answer: A



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4. The mean deviation of the data 2,7,9,11,15,16 from the median is

A. 3

B. 4

C. 5

D. 6

Answer: B



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5. If for a distribution

$\sum (x - 5) = 3$, $\sum (x - 5)^2 = 43$ and the

total number of terms is 18 then mean and variance are

A. $\bar{x} = \frac{93}{18}, \sigma^2 = \frac{85}{36}$

B. $\bar{x} = \frac{95}{18}, \sigma^2 = \frac{85}{36}$

C. $\bar{x} = \frac{31}{6}, \sigma^2 = \frac{85}{36}$

D. $\bar{x} = \frac{95}{18}, \sigma^2 = \frac{83}{36}$

Answer: A



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6. If the variance of the data 1,3,7,9,10,12 is 15 then the variance of the date 3,9,21,27,30,36 is

A. 45

B. 135

C. 30

D. 90

Answer: B



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Multiple Choice Questions

1. The measure of central tendency of a statistical data which takes into account all the data is

(i) mean

(ii) median

(iii) mode

(iv) range

A. mean

B. median

C. mode

D. range

Answer: A



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2. The mean of five numbers is 30. If one number is excluded, their mean becomes 28.

The excluded number is

(i) 28

(ii) 30

(iii) 35

(iv) 38

A. 28

B. 30

C. 35

D. 38

Answer: D



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3. The mean of 100 observations is 50. If one of the observations which was 50 is replaced by 150, the resulting mean will be

(i) 50.5

(ii) 51

(iii) 51.5

(iv) 52

A. 50.5

B. 51

C. 51.5

D. 52

Answer: B



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4. If \bar{x} is the mean of n observations $x_1, x_2, x_3, \dots, x_n$, then the value of

$$\sum_{i=1}^n (x_i - \bar{x}) \text{ is (i) } -1 \text{ (ii) } 0 \text{ (iii) } 1 \text{ (iv) } n-1$$

A. -1

B. 0

C. 1

D. $n-1$

Answer: B



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5. Median of the numbers 4,4,5,7,6,7,7,3,12 is (i)

4 (ii) 5 (iii) 6 (iv) 7

A. 4

B. 5

C. 6

D. 7

Answer: C



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6. The median of the data

78,56,22,34,45,54,39,68,54,84 is

(i) 45

(ii) 49.5

(iii) 54

(iv) 56

A. 45

B. 49.5

C. 54

D. 56

Answer: C



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7. The most frequently occurring number in a set of value is called

(i) mean

(ii) median

(iii) mode

(iv) range

A. mean

B. median

C. mode

D. range

Answer: C



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8. Mode of the data

:15,14,19,20,14,15,16,14,15,18,19,15,17,15 is (i) 14 (ii)

15 (iii) 16 (iv) 17

A. 14

B. 15

C. 16

D. 17

Answer: B



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9. If the mean of the following distribution is 2.6 Then the value of p is

Variable x : 1 2 3 4 5

frequency of x : 4 5 P 1 2

A. 2

B. 3

C. 2.6

D. 8

Answer: D



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

<i>Class</i>	13.8 – 14	14 – 14.2	14.2 – 14.4	14.4 – 14.6	14.6 – 14.8	14.8 – 15
<i>Frequency</i>	2	4	5	71	48	20

How many athletes completed the race in less than 14.6sec?

A. 11

B. 71

C. 82

D. 130

Answer: C



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11. Consider the following frequency distribution

Class	0-5	6-11	12-17	18-23	24-29
Frequency	13	10	15	8	11

The upper limit of the median class in

A. 17

B. 17.5

C. 18

D. 18.5

Answer: B



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12. 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 frequency of the upper limit of the median class and the lower limit of the modal class is

- A. 0
- B. 19
- C. 20
- D. 38

Answer: C



13. The mean deviation for n observations x_1, x_2, \dots, x_n from their median M is given by

(i) $\sum_{i=1}^n (x_i - M)$

(ii) $\frac{1}{n} \sum_{i=1}^n |x_i - M|$

(iii) $\frac{1}{n} \sum_{i=1}^n (x_i - M)^2$

(iv) $\frac{1}{n} \sum_{i=1}^n (x_i - M)$

A. $\sum_{i=1}^n (x_i - M)$

B. $\frac{1}{n} \sum_{i=1}^n |x_i - M|$

C. $\frac{1}{n} \sum_{i=1}^n (x_i - M)^2$

D. $\frac{1}{n} \sum_{i=1}^n (x_i - M)$

Answer: B



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14. The mean deviation of the data 4,5,7,8,9,10,6 from the median is

A. 2

B. 3

C. 4

D. 5

Answer: A



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15. The mean deviation of the data 4,5,7,8,9,10,6 from the median is

A. 1.87

B. 2.32

C. 1.71

D. 2.45

Answer: C



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16. The variance of first 5 natural numbers is

(i) 1

(ii) 2

(iii) 3

(iv) 4

A. 1

B. 2

C. 3

D. 4

Answer: B



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17. The standard deviation of first 11 natural numbers is

(i) 2

(ii) $2\sqrt{2}$

(iii) 3

(iv) $\sqrt{10}$

A. 2

B. $2\sqrt{2}$

C. 3

D. $\sqrt{10}$

Answer: D



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18. If for a distribution $\sum (x - 7) = 6$ and $\sum (x - 7)^2 = 78$ and the total number of items is 12 then mean and standard deviation are

A. $\bar{x} = 7.5, \sigma = 2.5$

B. $\bar{x} = 7, \sigma = 2.5$

C. $\bar{x} = 7.5, \sigma = 2$

D. $\bar{x} = 7, \sigma = 2$

Answer: A



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19. If for a distribution $\sum x_i^2 = 2400$ and $\sum x_i = 250$ and the total number of observations is 50, then variance is

A. (a) 20

B. (b) 21

C. (c) 22

D. (d) 23

Answer: D



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20. The mean of 100 observations is 50 and their standard deviation is 5. the sum of squares all the observations is

(i) 50000

(ii) 250000

(iii) 252500

(iv) 255000

A. 50000

B. 250000

C. 252500

D. 255000

Answer: C



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21. The mean of 100 observations is 40 and their standard deviation respectively is 10. if 5 is added to each observation then the new mean and new standard deviation will be

A. 40,10

B. 40,15

C. 50,10

D. 45,10

Answer: D



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22. The mean of 5 observations is 4.4 and variance is 8.24. If three of the five observations are 1, 2, and 6 then remaining two observations are

(i) 9, 16

(ii) 9, 4

(iii) 81, 16

(iv) 81, 4

A. 9, 16

B. 9, 4

C. 81,16

D. 81,4

Answer: B



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23. Let $x_1, x_2, x_3, \dots, x_n$ be n observations with mean \bar{x} and standard deviation σ . The mean the standard deviation of kx_1, kx_2, \dots, kx_n respectively are

(i) $\bar{x}, k\sigma$

(ii) $k\bar{x}, \sigma$

(iii) $k\bar{x}, k\sigma$

(iv) \bar{x}, σ

A. $\bar{x}, k\sigma$

B. $k\bar{x}, \sigma$

C. $k\bar{x}, k\sigma$

D. \bar{x}, σ

Answer: C



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24. If $x_1, x_2, x_3, \dots, x_n$ be n observations with mean \bar{x} and variance σ^2 . The mean and variance of

$x_1 + k, x_2 + k, x_3 + k, \dots, x_n + k$

respectively are (i) $\bar{x} + k, \sigma^2$ (ii)

$\bar{x} + k, \sigma^2 + k^2$ (iii) $\bar{x} + k, (\sigma + k)^2$ (iv) \bar{x}, σ^2

A. $\bar{x} + k, \sigma^2$

B. $\bar{x} + k, \sigma^2 + k^2$

C. $\bar{x} + k, (\sigma + k)^2$

D. \bar{x}, σ^2

Answer: A



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25. Consider the numbers 1,2,3,4,5,6,7,8,9,10. If 2 is added to each number then variance of the numbers so obtained is

(i) 6.5

(ii) 2.87

(iii) 3.87

(iv) 8.25

A. 6.5

B. 2.87

C. 3.87

D. 8.25

Answer: D



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26. A set of n values x_1, x_2, \dots, x_n has standard deviation σ . The standard deviation of n values $x_1 - k, x_2 - k, \dots, x_n - k$ is

A. $\sigma - k$

B. $\sigma + k$

C. σ

D. $k\sigma$

Answer: C



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27. A set of n value x_1, x_2, \dots, x_n has mean \bar{x} and standard deviation σ . The mean and standard deviation of n values

$\frac{x_1}{k}, \frac{x_2}{k}, \dots, \frac{x_n}{k}$ ($k \neq 0$ respectively are

(i) $k\bar{x}, \frac{\sigma}{k}$

(ii) $\frac{\bar{x}}{k}, \frac{\sigma}{k}$

(iii) $k\bar{x}, k\sigma$

(iv) $\frac{\bar{x}}{k}, k\sigma$

A. $k\bar{x}, \frac{\sigma}{k}$

B. $\frac{\bar{x}}{k}, \frac{\sigma}{k}$

C. $k\bar{x}, k\sigma$

D. $\frac{\bar{x}}{k}, k\sigma$

Answer: B



28. Calculate the possible values of x , if the standard deviation of the numbers 2, 3, $2x$ and 11 is 3.5.

A. $3, \frac{5}{3}$

B. $2, \frac{7}{3}$

C. 3,4

D. $3, \frac{7}{3}$

Answer: D



29. The coefficient of variation of two distributions are 70 and 75 and their standard deviations are 28 and 27 respectively. The difference of their arithmetic means is

A. 2

B. 3

C. 4

D. 5

Answer: C



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30. The coefficient of variation of distributions are 50 and 60 and their arithmetic means are 30 and 25 respectively. The difference of their standard deviations is

A. 0

B. 1

C. 1.5

D. 2.5

Answer: A



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31. Let x_1, x_2, \dots, x_n be n observations and \bar{x} be their arithmetic mean. The formula for the standard deviation is

A. $\sum (x_i - \bar{x})^2$

B. $\frac{\sum (x_i - \bar{x})^2}{n}$

C. $\sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$

D. $\sqrt{\frac{\sum x_i^2}{n} + \bar{x}^2}$

Answer: C



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32. The marks scored by 10 students in a monthly test are:

9, 13, 17, 6, 8, 13, 11, 10, 5, 9

The median marks are

A. 9

B. 10

C. 9.5

D. 10.5

Answer: C



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33. If the median of the numbers 6, 14, 15, 17, $x-1$, $x+2$, 29, 32, 35, 45 written in ascending order is 21.5, then the value of x is

A. 20

B. 21

C. 22

D. 21.5

Answer: B



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34. Find the Q_1 and Q_3 for the following distribution : 5, 3, 6, 3, 13, 9, 8, 24, 19, 20, 18.

A. 6

B. 5

C. 3

D. 5.5

Answer: B



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35. For the data given the inter-quartile range is

A. 7

B. 19

C. 14

D. 9

Answer: C



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36. For the data : 28, 17, 12, 25, 26, 19, 13, 27, 21, 16, the third quartile is

A. 25.5

B. 26

C. 26.25

D. 26.75

Answer: C



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37. For the data For the data : 28, 17, 12, 25, 26,
19, 13, 27, 21, 16

6th decile is

A. 22

B. 23.4

C. 24

D. 25

Answer: B



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38. For the data For the data : 28, 17, 12, 25, 26,
19, 13, 27, 21, 16

70th percentile is

A. 25

B. 26

C. 25.25

D. 25.7

Answer: D



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39. For the distribution $x_i : 18, 20, 9, 15, 21, 26, 14, 13, 27, 22, 16, 28$, the 7th decile is

A. (a)22

B. (b)26

C. (c)24

D. (d)22.4

Answer: D



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40. For the distribution x_i given 18, 20, 9, 15, 21, 26, 14, 13, 27, 22, 16, 28 the 40th percentile is

A. 16

B. 16.4

C. 15

D. 18

Answer: B



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41. In the following frequency distribution :

x	0	1	3	5	6	8	10
f	2	6	7	21	19	15	3

The mode is



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42. If the median and mean of moderately asymmetrical frequency distribution are 72 and 74 respectively, then the mode is

A. 68

B. 76

C. 75

D. 70

Answer: A



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43. If the mean and the mode of a moderately skewed frequency distribution are 90 and 96 respectively, then the median is

A. 93

B. 92

C. 98

D. 88

Answer: B



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44. The abscissa of the point of intersection of less than type and more than type ogives gives its

A. mean

B. mode

C. median

D. all the three measures

Answer: C



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45. Q_1 is always equal to :

A. P_1

B. P_{10}

C. P_{25}

D. P_{50}

Answer: C



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Exercise 28 A

1. One set of 100 observations has the mean 15 and another set of 150 observations has the mean 16. Find the mean of 250 observations by combining the two sets of given observations.



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2. The mean age of 40 students is 16 years and the mean age of another group of 60 students is 20 years. Find out the mean age of all the 100 students combined together.



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3. The mean of marks obtained in an examination by a group of 100 students is found to be 49.46. The mean of the marks obtained in the same examination by another

of 200 students was 52.32. Find the mean of the marks obtained by both the groups of students taken together .



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4. Two samples of sizes 50 and 100 are given. The mean of these samples respectively are 56 and 50. Find the mean of size 150 by combining.



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5. The mean and standard deviation of distribution of 100 and 150 items are 50,5 and 40,6 respectively. Find the mean and standard deviation of all the 250 items taken together.



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Exercise 28 B

1. Find the median of the following sets of data :

2,3,5,7,9



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2. Find the median of the following sets of data :

4,8,12,16,20,23,28,32



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3. Find the median of the following sets of data :

60,33,63,61,44,48,51





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4. Find the median of the following sets of data :

13,22,25,.8,11,19,17,31,16,10



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5. Find the median of the following data :
41,43,127,99,61,92,71,58,57, If 58 is replaced by
85, what will be the new median ?



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6. Find whether the following statements are true or false:

The median of a discrete ungrouped frequency distribution containing a number of items is the value of the middle item, the data being arranged in ascending or descending order.



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7. In a school examination it is decided that exactly half the pupils will pass. Name the measure of central tendency that is used.



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8. $(1,2,3,6,8)$ is a set of five positive integers whose mean is 4 and median is 3. Write down two other sets of five positive integers, each having the same mean and median as this set .

Find the median from the following distributions :



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9. Find the median and first and third quartile for the following data :

2,4,6,8,10,12,14,16,18,20,22



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10. Compute Q_1 , Q_3 , D_3 , D_6 and D_8 for the following data :

14,7,13,12,13,17,8,10,6,15,18,21,20



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11. Following are the scores of 12 students in a class test of 30 marks :

18,20,9,15,21,26,14,13,27,22,16,28 Find D_7 and P_{33}



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Exercise 28 C

1. Find the mode of the following data :

3,4,7,11,4,3,4,5,6,4,1,4,2,4,4



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2. Find the mode of the following data :

Size of shoes : 4,4.5,5,4.5,5.5,5,6,4.5,4,4.5



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3. Find the mode of the following data :

Wages (₹.) :

100,120,100,120,130,120,120,130,120,100



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4. Find the mode of the following data :

Runs in an innings :

18,32,0,40,60,69,33,69,35,11,20



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5. If the frequency of the class 70-85 is 13 instead of 3, then what difference will it make ?



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

The data

17,32,35,33,15,21,41,32,11,18,20,22,11,15,35,23,38,12.



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Exercise 28 D

1. In an asymmetrical distribution mean is 58 and median is 61. Calculate mode.



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2. If mode in a tolerably asymmetrical distribution is 12 and median is 16, what would be the most probable mean ?



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3. Fill the median if mean is 40 and mode is 36.



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Chapter Test

1. The means of two sets of sizes 40 and 60 respectively are 15 and 16 and the standard deviations are 3 and 4. Obtain the mean and

standard deviation of the composite set of 100 items when the two sets are pooled together.



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2. Find the median of the following values :

7 cm, 9 cm, 10 cm, 12 cm, 15 cm ,18 cm, 20 cm.



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3. The marks obtained by 12 students out of 50 are as under :

25,24,23,32,40,27,30,25,20,15,16,45 Find the median marks.



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4. Compute Q_3 , D_6 and P_{70} for the following data :

28,17,12,25,26,19,13,27,21,16



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