



MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

STATISTICS

Illustration

1. If a variate x is expressed as a linear function of two variates u and v in the form $x = au + bv$, then mean \bar{x} of x is

A. a) $a\bar{U} - b\bar{V}$

B. b) $\bar{U} + \bar{V}$

C. c) $b\bar{U} + a\bar{V}$

D. d) None of these

Answer: D

 [Watch Video Solution](#)

2. If the mean of the numbers $27 + x, 31 + x, 89 + x, 107 + x, 156 + x$ is 82, then the mean of $130 + x, 126 + x, 68 + x, 50 + x, 1 + x$ is

A. 75

B. 157

C. 82

D. 80

Answer: A



Watch Video Solution

3. If the arithmetic mean of the numbers $x_1, x_2, x_3, \dots, x_n$ is \bar{x} , then the arithmetic mean of the numbers $ax_1 + b, ax_2 + b, ax_3 + b, \dots, ax_n + b$, where a, b are two constants, would be

A. \bar{x}

B. $na\bar{x} + nb$

C. $a\bar{x}$

D. $a\bar{x} + b$

Answer: D

 **Watch Video Solution**

4. The weighted means of of first n natural numbers whose weights are equal to the squares of corresponding numbers is

A. $\frac{n + 1}{2}$

B. $\frac{3n(n + 1)}{2(2n + 1)}$

C. $\frac{(n + 1)(2n + 1)}{6}$

D. $\frac{n(n + 1)}{2}$

Answer: B



Watch Video Solution

5. A student obtain 75 % , 80 % and 85 % in three subjects if the marks of another subject are added. Then the average cannot be less than

A. 0.6

B. 0.65

C. 0.8

D. 0.9

Answer: A



Watch Video Solution

6. If \bar{x}_1 and \bar{x}_2 are the means of two distributions such that $\bar{x}_1 < \bar{x}_2$ and \bar{x} is the mean of the combined distribution, then

A. $\bar{x} < \bar{x}_1$

B. $\bar{x} > \bar{x}_2$

C. $\bar{x} = \frac{\bar{x}_1 + \bar{x}_2}{2}$

D. $\bar{x}_1 < \bar{x} < \bar{x}_2$

Answer: D



Watch Video Solution

7. Mean of 100 items is 49. It was discovered that three items which should have been 60, 70, 80 were wrongly read as 40, 20, 50 respectively. The correct mean is. (a) 48
(b) $82\frac{1}{2}$ (c) 50 (d) 80

A. 48

B. 82.5

C. 50

D. 80

Answer: C



Watch Video Solution

8. The mean weight per student in a group of 7 students is 55 kg. The individual weights of 6 of them (in kg) are 52, 54, 53, 56 and 54. Find the weight of the seventh student.

A. 55 kg

B. 60 kg

C. 57 kg

D. 50 kg

Answer: C



Watch Video Solution

9. If a variable takes the discrete values $\alpha + 4$,

$$\alpha - \frac{7}{2}, \alpha - \frac{5}{2}, \alpha - 2, \alpha - 3, \alpha + \frac{1}{2}, \alpha - \frac{1}{2}, \alpha + 5 (\alpha > 0)$$

, then the median is

A. $\alpha - \frac{5}{4}$

B. $\alpha - \frac{1}{2}$

C. $\alpha - 2$

D. $\alpha + \frac{5}{4}$

Answer: A



Watch Video Solution

10. The median of a set of nine distinct observations is 20.5. If each of the last four observations of the set is increased by 2, then the median of the new set is

- A. Is increased by 2
- B. Is decreased by 2
- C. Is two times the original median
- D. Remains the same as that of the original set

Answer: D



Watch Video Solution

11. If in a moderately asymmetrical distribution the mode and the mean of the data are 6λ and 9λ , respectively, then the median is

A. 8λ

B. 7λ

C. 6λ

D. 5λ

Answer: A



Watch Video Solution

12. The mean deviation about the mean of the following distribution is

Size	20	21	22	23	24
Frequency	6	4	5	1	4

- A. 1
- B. 1.25
- C. 1.5
- D. 1.75

Answer: B



Watch Video Solution

13. The mean deviation about the median of the following distribution is

Marks obtained	10	11	12	14	15
Number of students	2	3	8	3	4

 [Watch Video Solution](#)

14. about to only mathematics

A. $\frac{n^2 - 1}{12}$

B. $\frac{n^2 - 1}{6}$

C. $\frac{n^2 + 1}{6}$

D. $\frac{n^2 + 1}{12}$

Answer: A

 [Watch Video Solution](#)

15. The mean of five observations is 4 and their variance is 5.2. If three of these observations are 1, 2 and 6, then the other two are

A. 2 and 9

B. 3 and 8

C. 4 and 7

D. 5 and 6

Answer: C

 [Watch Video Solution](#)

16. The standard deviation of data 6,5,9,13,12,8 and 10 is

A. $\sqrt{\frac{52}{7}}$

B. $\frac{52}{7}$

C. $\sqrt{6}$

D. 6

Answer: A



Watch Video Solution

17. Consider the frequency distribution, where A is a positive interger : variance is 160.

x	A	2A	3A	4A	5A	6A
f	2	1	1	1	1	1



Watch Video Solution



Watch Video Solution

18. Find The standard deviation of the following frequency distribution is

X	2	3	4	5	6	7
f	4	9	16	14	11	6

A. 1.38

B. 1.42

C. 1.45

D. 1.60

Answer: A



Watch Video Solution

19. Let a, b, c, d, e , be the observations with m and standard deviation s . The standard deviation of the observations $a+k, b+k, c+k, d+k, e+k$ is (a) s (b) ks (c) $s + k$ (d) $\frac{s}{k}$

A. s

B. ks

C. $s+k$

D. $\frac{s}{k}$

Answer: A



[Watch Video Solution](#)

1. In a class of 100 students, there are 70 boys whose average marks in a subject is 75. If the average marks of the complete class is 72, then what is the average of the girls ?

A. 73

B. 65

C. 68

D. 74

Answer: B



Watch Video Solution

2. The median of a set of nine distinct observations is 20.5. If each of the last four observations of the set is increased by 2, then the median of the new set is

- A. Is increased by 2
- B. In decreased by 2
- C. Is two times the original median
- D. Remains the same as that of the original set

Answer: D



Watch Video Solution

3. If in a frequency distribution, the mean and median are 21 and 22 respectively, then its mode is approximately.

A. 22.0

B. 20.5

C. 25.5

D. 24.0

Answer: D



[Watch Video Solution](#)

4. The average marks of boys in a class is 52 and that of girls is 42. The average marks of boys and girls combined

is 50. The percentage of boys in the class is

A. 40

B. 20

C. 80

D. 60

Answer: C



Watch Video Solution

5. Compute the median from the following table

Marks obtained	No. of students
0-10	2
10-20	18
20-30	30
30-40	45
40-50	35
50-60	20
60-70	6
70-80	3

A. 36.55

B. 35.55

C. 40.05

D. None of these

Answer: A



Watch Video Solution

Exercise 11 2

1. In an experiment with 15 observations of x the following results were available $\sum x^2 = 2830$, $\sum x = 170$ one observation that was 20 was found to be wrong and it was replaced by its correct value of 30. Then the corrected variance is

- A. 78.00
- B. 188.66
- C. 177.33
- D. 8.33

Answer: A



[Watch Video Solution](#)

2. In a series of $2n$ observations, half of them equal a and the remaining half equal $-a$. If the S.D. of the observations is 2, then $|a|$ equals

A. $\frac{1}{n}$

B. $\sqrt{2}$

C. 2

D. $\frac{\sqrt{2}}{n}$

Answer: C



Watch Video Solution

3. Suppose a population A has 100 observations 101, 102, , 200 and another population B has 100 observations 151, 152,250. If V_A and V_B represent the variances of the two populations respectively, then $\frac{V_A}{V_B}$ is

A. 1

B. 9/4

C. 4/9

D. 2/3

Answer: A



Watch Video Solution

4. The mean of the numbers a , b , 8 , 5 , 10 is 6 and the variance is 6.80 . Then which one of the following gives possible values of a and b ?

A. $a=0, b=7$

B. $a=5, b=2$

C. $a=1, b=6$

D. $a=3, b=4$

Answer: D

 [Watch Video Solution](#)

5. Let x_1, x_2, x_3, x_4, x_5 be the observations with mean m and standard deviation s . The standard deviation of the

observations $kx_1, kx_2, kx_3, kx_4, kx_5$ is

A. $k+s$

B. $\frac{s}{k}$

C. ks

D. s

Answer: C



Watch Video Solution

6. Let x_1, x_2, \dots, x_n be n observations. Let $w_i = lx_i + k$ for $i = 1, 2, \dots, n$, where l and k are constants. If the mean of x_i is 48 and their standard

deviation is 12 the mean of w_i 's is 55 and standard deviation of w_i is 15 then the value of l and k should be

A. $l=2.5, k=5$

B. $l=-1.25, k=5$

C. $l=2.5, k=-5$

D. $l=1.25, k=-5$

Answer: D

 [Watch Video Solution](#)

Exercises

1. Coefficients of variation of two distributions are 50 and 60, and their arithmetic means are 30 and 25, respectively.

Difference of their standard deviations is

a. 0

b. 1

c. 1.5

d. 2.5

A. 0

B. 1

C. 1.5

D. 2.5

Answer: A



Watch Video Solution

2. The mean of a set of numbers is \bar{X} . If each number is divided by 3, then the new mean is

A. \bar{X}

B. $\bar{X} + 3$

C. $3\bar{X}$

D. $\frac{\bar{X}}{3}$

Answer: D



Watch Video Solution

3. The A.M. of the series 1, 2, 4, 8, 16, , 2^n is -

A. $\frac{2^n - 1}{n}$

B. $\frac{2^{n+1} - 1}{n + 1}$

C. $\frac{2^n + 1}{n}$

D. $\frac{2^n - 1}{n + 1}$

Answer: B



Watch Video Solution

4. The mean of n items is \bar{X} . If the first item is increased by 1, second by 2 and so on, then the new mean is

A. $\bar{X} + n$

B. $\bar{X} + \frac{n}{2}$

C. $\bar{X} + \frac{n+1}{2}$

D. None of these

Answer: C

 [Watch Video Solution](#)

5. For a slightly asymmetric distribution, mean and median are 5 and 6, respectively. What is its mode ?

A. 8

B. 11

C. 6

D. None of these

Answer: A



Watch Video Solution

6. For a normal distribution if the mean is M , mode is M_0 and median is M_d , then

A. $M > M_d > M_0$

B. $M < M_d < M_0$

C. $M = M_d M_0$

D. $M = M_d = M_0$

Answer: D



Watch Video Solution

7. The following data give the distribution of heights of students :

Height (in cm)	160	150	152	161	156	154	155
Numbers of students	12	8	4	4	3	3	7

The median of the distribution is

A. 154

B. 155

C. 160

D. 161

Answer: B



Watch Video Solution

8. An automobile driver travels from a plain to a hill station 120 km away at an average speed of 30 km per hour. He then makes the return trip at an average speed 25 km per hour. He covers another 120 km on the plain at an average speed of 50 km per hour. His average speed (in km/hr) over the entire distance of 360 km will be

A. $\frac{30 + 25 + 50}{3}$

B. $\frac{\frac{a}{30} + \frac{1}{25} + \frac{1}{50}}{3}$

C. $\frac{3}{\frac{1}{30} + \frac{1}{25} + \frac{1}{50}}$

D. None of these

Answer: C



Watch Video Solution

9. The mean deviation of the data 3,10,10,4,7,10,5 from the mean is

- A. 2
- B. 2.57
- C. 3
- D. 3.75

Answer: B



[Watch Video Solution](#)

10. when tested the lives (in hours) of 5 bulbs were noted as follows 1357,1090,1666,1494,1623

The mean deviations (in hours) from their mean is

- A. 178
- B. 179
- C. 220
- D. 356

Answer: A

 [Watch Video Solution](#)

11. Following are the marks obtained by 9 student in a mathematics test

50,69,20,33,53,39,40,65,59,

The mean deviation from the median is

A. 9

B. 10.5

C. 12.67

D. 14.76

Answer: C



Watch Video Solution

12. If the mean of the distribution is 2.6, then the value of y is

Variate x	1	2	3	4	5
Frequency f of x	4	5	y	1	2

A. 24

B. 13

C. 8

D. 3

Answer: C



Watch Video Solution

13. If the mean of the set of numbers $x_1, x_2, x_3, \dots, x_n$ is \bar{x} , then the mean of the numbers $x_i + 2i, 1 \leq i \leq n$ is

A. $\bar{x} + 2n$

B. $\bar{x} + n + 1$

C. $\bar{x} + 2$

D. $\bar{x} + n$

Answer: B

 [Watch Video Solution](#)

14. The harmonic mean of 4,8,16 is

A. 6.4

B. 6.7

C. 6.85

D. 7.8

Answer: C

 [Watch Video Solution](#)

15. The average of n numbers $x_1, x_2, x_3, \dots, x_n$ is M . If x_n is replaced by x' , then new average is

A. $M - x_n + x'$

B. $\frac{nM - x_n + x'}{n}$

C. $\frac{(n - 1)M + x'}{n}$

D. $\frac{M - x_n + x'}{n}$

Answer: B



Watch Video Solution

16. The following data gives the distribution of height of students :

Height (in cm)	160	150	152	161	156	154	155
Numbers of students	12	8	4	4	3	3	7

The median of the distribution is

A. 154

B. 155

C. 160

D. 161

Answer: B



[Watch Video Solution](#)

17. For a slightly asymmetric distribution, mean and median are 5 and 6, respectively. What is its mode ?

A. 5

B. 6

C. 7

D. 8

Answer: D



Watch Video Solution

18. Runs scored by a batsman in 10 innings are : 38, 70, 48, 34, 42, 55, 63, 46, 54, 44

The mean deviation about median is

A. 8.6

B. 6.4

C. 10.6

D. 9.6

Answer: A



Watch Video Solution

19. If μ the mean of distribution (y_i, f_i) , then

$$\sum f_i(y_i - \mu) =$$

A. M.D.

B. S.D.

C. 0

D. Relative frequency

Answer: C



Watch Video Solution

20. The range of the following set of observations

2, 3, 5, 9, 8, 7, 6, 5, 7, 4, 3 is

A. 11

B. 7

C. 5.5

D. 6

Answer: B



Watch Video Solution

21. If each observation of a raw data whose variance is σ is multiplied by h , then the variance of the new set is

A. σ^2

B. $h^2 \sigma^2$

C. $h\sigma^2$

D. $h + \sigma^2$

Answer: B



Watch Video Solution

22. The freezing point of nitrobenzene is $3^{\circ}C$. When 1.2 g of chloroform (mol. Wt. =120) is dissolved in 100 g of nitrobenzene, freezing point will be $2.3^{\circ}C$. When 0.6 g of acetic acid is dissolved in 100 g of nitrobenzene, freezing point of solution is $2.64^{\circ}C$. If the formula of acetic acid is $(CH_2O)_n$, find the value of n.

A. $\frac{n^2 - 1}{12}$

B. $\frac{n}{2}$

C. $\frac{n}{4}$

D. None of these

Answer: C



Watch Video Solution

23. Variance of the data 2,4,6,8,10 is

A. 6

B. 7

C. 8

D. None of these

Answer: C



Watch Video Solution

24. If the standard deviation of 0, 1, 2, 3...9 is K , then the standard deviation of 10, 11, 12, 13....19 is

A. K

B. $K+10$

C. $K + \sqrt{10}$

D. $10 K$

Answer: A



Watch Video Solution

25. For a given distribution of marks, the mean is 35.16 and its standard deviation is 19.76. The coefficient of variation is

A. $\frac{35.16}{19.76}$

B. $\frac{19.76}{35.16}$

C. $\frac{35.16}{19.76} \times 100$

D. $\frac{19.76}{35.16} \times 100$

Answer: D



Watch Video Solution

26. The mean and S.D of 1, 2, 3, 4, 5, 6 is

A. $\frac{7}{2}, \sqrt{\frac{35}{2}}$

B. 3, 3

C. $\frac{7}{2}, \sqrt{3}$

D. 3, $\frac{35}{12}$

Answer: A



Watch Video Solution

27. The standard deviation of 25 numbers is 40. If each of the numbers is increased by 5, then the new standard deviation will be -

A. 40

B. 45

C. $40 + \frac{21}{25}$

D. None of these

Answer: A



Watch Video Solution

28. Consider any set of observations $x_1, x_2, x_3, \dots, x_{101}$. It is given that $x_1 < x_2 < x_3 < \dots < x_{100} < x_{101}$, then the mean deviation of this set of observations about a point k is minimum when k equals

A. x_1

B. x_{51}

C. $\frac{x_1 + x_2 + \dots + x_{101}}{101}$

D. x_{50}

Answer: B



Watch Video Solution

29. For $(2n+1)$ observations $x_1, x_2, -x_2, \dots, x_n, -x_n$ and 0, where all x 's are distinct, let SD and MD denote the standard deviation and median, respectively. Then which of the following is always true ?

A. $SD < MD$

B. $SD > MD$

C. $SD=MD$

D. Nothing can be said in general about the relationship between SD and MD

Answer: B



Watch Video Solution

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

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

A. $S \leq r \sqrt{\frac{n}{n-1}}$

B. $S = r \sqrt{\frac{n}{n-1}}$

C. $S \geq r \sqrt{\frac{n}{n-1}}$

D. None of these

Answer: A



Watch Video Solution

31. If the standard deviation of a variable $\xi s \sigma$, then

standard deviation of variable $\frac{aX + b}{c}$ is $a\sigma$ (b) $\frac{a}{c}\sigma$ (c)

$$\left| \frac{a}{c} \right| \sigma \text{ (d) } \frac{a\sigma + b}{c}$$

A. $\left(\frac{a}{c} \right) \sigma$

B. $\left| \frac{a}{c} \right| \sigma$

C. $\left(\frac{a^2}{c^2} \right) \sigma$

D. None of these

Answer: B



Watch Video Solution

32. The standard deviation of data 6,5,9,13,12,8 and 10 is

A. $\sqrt{\frac{52}{7}}$

B. $\frac{52}{7}$

C. $\sqrt{6}$

D. 6

Answer: A

 [Watch Video Solution](#)

33. If the mean of 100 observations is 50 and their standard deviations is 5, then the sum of all squares of all the observations is

A. 50000

B. 250000

C. 252500

D. 255000

Answer: C



Watch Video Solution

34. The standard deviation of first 10 natural numbers is

a) 8.25

(b) 6.5

(c) 3.87

(d) 2.87

A. 5.5

B. 3.87

C. 2.97

D. 2.87

Answer: D

 [Watch Video Solution](#)

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

A. 6.5

B. 2.87

C. 3.87

D. 8.25

Answer: D



Watch Video Solution

36. Consider the first 10 positive integers. If we multiply each number by -1 and then add 1 to each number, the variance of the number so obtained

A. 8.25

B. 6.5

C. 3.87

D. 2.87

Answer: A



Watch Video Solution

37. If for a sample of size 60, we have the following information $\sum \xi^2 = 18000$ and $\sum \xi = 960$, then the variance is

a) 6.63

(b) 16

(c) 22

(d) 44

A. 6.63

B. 16

C. 22

D. 44

Answer: D



Watch Video Solution

38. The standard deviation of some temperature data in $^{\circ}C$ is 5 .If the data were converted into $^{\circ}F$ then variance would be

A. 81

B. 57

C. 36

D. 25

Answer: A



Watch Video Solution

39. What is the standard deviation of the following data ?

Measurement	0 – 10	10 – 20	20 – 30	30 – 40	(a)
Frequency	1	3	4	2	

81 (b) 7.6 (c) 9 (d) 2.26

A. 81

B. 7.6

C. 9

D. 2.26

Answer: C



Watch Video Solution

1. If the mean deviation of the numbers $1, 1 + d, 1 + 2d, \dots, 1 + 100d$ from their mean is 25, then the d is equal to

(1) 10.0

(2) 20.0

(3) 10.1

(4) 20.2

A. 10.0

B. 20.0

C. 10.1

D. 20.2

Answer: C



Watch Video Solution

2. In a binomial distribution $B\left(n, p = \frac{1}{4}\right)$, if the probability of at least one success is greater than or equal

to $\frac{9}{10}$, then n is greater than (1) $\frac{1}{(\log)_{10}^4 - (\log)_{10}^3}$

(2) $\frac{1}{(\log)_{10}^4 + (\log)_{10}^3}$

(3) $\frac{1}{(\log)_{10}^4 - (\log)_{10}^3}$

(4) $\frac{4}{(\log)_{10}^4 - (\log)_{10}^3}$

A. $\frac{1}{\log_{10} 4 - \log_{10} 3}$

B. $\frac{1}{\log_{10} 4 + \log_{10} 3}$

C. $\frac{9}{\log_{10} 4 - \log_{10} 3}$

D. $\frac{4}{\log_{10} 4 - \log_{10} 3}$

Answer: A



Watch Video Solution

3. For two data sets, each of size 5, the variances are given to be 4 and 5 and the corresponding means are given to be 2 and 4, respectively. The variance of the combined data set is

(1) $\frac{11}{2}$

(2) 2

(3) $\frac{13}{2}$

(4) $\frac{5}{2}$

A. $\frac{13}{2}$

B. $\frac{5}{2}$

C. $\frac{11}{2}$

D. 6

Answer: C



Watch Video Solution

4. If the mean deviation about the median of the numbers $a, 2a, \dots, 50a$ is 50, then $|a|$ equals :

(1) 2

(2) 3

(3) 4

(4) 5

A. 5

B. 2

C. 3

D. 4

Answer: D



Watch Video Solution

5. Let x_1, x_2, \dots, x_n be n observations, and let \bar{x} be their arithmetic mean and σ^2 be their variance.

Statement 1: Variance of $2x_1, 2x_2, \dots, 2x_n$ is $4\sigma^2$.

Statement 2: Arithmetic mean of

$2x_1, 2x_2, \dots, 2x_n$ is $2\bar{x}$. (1) Statement 1 is false,

statement 2 is true (2) Statement 1 is true, statement 2 is

true; statement 2 is a correct explanation for statement 1

(3) Statement 1 is true, statement 2 is true; statement 2 is not a correct explanation for statement 1 (4) Statement 1 is true, statement 2 is false

A. Statement 1 is false, statement 2 is true.

B. Statement 1 is true, statement 2 is true, statement 2 is a correct explanation for statement 1.

C. Statement 1 is true, statement 2 is true , statement 2 is not a correct explanation for statement 1.

D. Statement 1 is true, statement 2 is false.

Answer: D



Watch Video Solution

6. All the students of a class performed poorly in Mathematics. The teacher decided to give grace marks of 10 to each of the students. Which of the following statistical measures will not change even after the grace marks were given ? (1) median (2) mode (3) variance (4) mean

A. median

B. mode

C. variance

D. mean

Answer: c



Watch Video Solution

7. The variance of first 50 even natural numbers is

(1) $\frac{833}{4}$

(2) 833

(3) 437

(4) $\frac{437}{4}$

A. $\frac{833}{4}$

B. 833

C. 437

D. $\frac{437}{4}$

Answer: B



Watch Video Solution

8. The mean of the data set comprising of 16 observations is 16. If one of the observation valued 16 is deleted and three new observations valued 3, 4 and 5 are added to the data, then the mean of the resultant data, is :

- (1) 16.8
- (2) 16.0
- (3) 15.8
- (4) 14.0

A. 16.8

B. 16.0

C. 15.8

D. 14.0

Answer: D





9. If the standard deviation of the numbers 2, 3, a and 11 is 3.5, then which of the following is true ?

(1) $3a^2 - 26a + 55 = 0$

(2) $3a^2 - 32a + 84 = 0$

(3) $3a^2 - 34a + 91 = 0$

(4) $3a^2 - 23a + 44 = 0$

A. $3a^2 - 32a + 84 = 0$

B. $3a^2 - 34a + 91 = 0$

C. $3a^2 - 23a + 44 = 0$

D. $3a^2 - 26a + 55 = 0$

Answer: A

 [Watch Video Solution](#)

10. If $\sum_{i=1}^9 (x_i - 5)$ and $\sum_{i=1}^9 (i - 1)^9 (x_i - 5)^2 = 45$, then

the standard deviation of the 9 items x_1, x_2, \dots, x_9 is

A. 3

B. 9

C. 4

D. 2

Answer: D

 [Watch Video Solution](#)

