MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

STATISTICS

Others

1. From the data given below state which group is more variable G_1 or G_2? Marks 10-20 20-30 30-40 40-50 50-60 60-70 70-80 Group G_1 9 17 32 33 40 10 9 Group G_2 10 20 30 25 43 15 7

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2. From the prices of shares X and Y given below: find out which is more stable value: X: 35 54 52 53 56 58 52 50 50 49

Y: 108 107 105 105 106 107 104 103 104 101

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3. The following are some particulars of the distribution of weights of boys and girls in a class: Boys Girls Number 100 50 Mean 60kg 45kg Variance 9 4 Which of the distributions is more variable?

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4. For a frequency distribution mean deviation from mean in computed by: (a) $M\dot{D} = \dfrac{\sum f}{\sum f|d|}$ (b) $M\dot{D} = \dfrac{\sum d}{\sum f}$ (c) $M\dot{D} = \dfrac{\sum fd}{\sum f}$ (d) $M\dot{D} = \dfrac{\sum f|d|}{\sum f}$

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5. Calculate mean deviation about mean from the following data: x_i : 3 9 17 23 27 f_i : 8 10 12 9 5

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6. Calculate the mean deviation about median age for the age distribution of 100 persons given below: Age   16-20

21-25   26-30   31-35   36-40   41-45   46-50   51-55

| Number | 5 | 6 | 12 | 14 | 26 | 12 |
| 16 | 9 |

7. Calculate mean deviation from the median of the following data: Class interval: 0-6 6-12 12-18 18-24 24-30 Frequency 4 5 3 6 2

8. Find the mean deviation about the mean for the following data: Marks obtained 10-20 20-30 30-40 40-50 50-60 60-70 70-80 Number of students 2 3 8 14 8 3 2

9. The age distribution of 100 life-insurance policy holders is as follows: Age (on nearest birthday) 17-19.5 20-25.5 26-35.5 36-40.5 41-50.5 51-55.5 56-60.5 61-70.5   No. of persons 5 16 12 26 14 12 6 5 Calculate the mean deviation from median age.

10. Calculate the median deviation from the median of the following data: Wages per week (in Rs.), 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 No. of workers, 4, 6, 10, 20, 10, 6, 4

11. Find the mean deviation from the mean of the following data: Classes:, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 frequency, 2, 3, 8, 14, 8, 3, 2

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12. Find the mean deviation from the median for the following data: Size:, 10, 11, 12, 14, 15 Frequency:, 2, 3, 8, 3, 4

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13. Find the mean deviation about the median of the following frequency distribution: Class:, 0-6, 6-12, 12-18, 18-24, 24-30 Frequency:, 8, 10, 12, 9, 5

14. Find the mean deviation from the mean for the following data: Size:, 20, 21, 22, 23, 24 frequency, 6, 4, 5, 1, 4

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15. Find the mean deviation from the mean for the following data: Size: 1 3 5 7 9 11 13 15 Frequency: 3 3 4 14 7 4 3 4

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16. The following table gives the number of finished articles turned out per day be different number of workers in a factors. Find the standard deviation of the daily output of

finished articles. Find the variance and standard deviation of the following frequency distribution: Number of article:, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 No. of workers:, 3, 7, 11, 14, 18, 17, 13, 8, 5, 4

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17. If a is positive integer and the frequency distribution: $x:$, A, 2a, 3a, 4a, 5a, 6a $f:$, 2, 1, 1, 1, 1, 1 and variance is 160 then find the value of a.

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18. There are 60 students in a class. The following is the frequency distribution of marks obtained by the students in

a test: Marks: 0 1 2 3 4 5 Frequency $x - 2$, x , x^2 , $(x + 1)^2$, $2x$, $x + 1$ `Determine the mean and standard deviation.

19. Find the mean, and standard deviation for the following data: (i) Year render: 10 20 30 40 50 60 No. of persons (cumulative): 15 32 51 78 97 109

20. Find the mean and standard deviation of first n terms of an A.P. whose first term is a and common difference is d.

21. Find the mean of the following frequency distribution:

Variable (x_i) , 2, 4, 6, 8, 10, 12, 14, 16 Frequency (f_i) , 4, 4, 5, 15, 8, 5, 4, 5

22. Calculate the variance and standard deviation from the data given below: Size of item, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5 Frequency , 3, 7, 22, 60, 85, 32, 8

23. Find the variance and standard deviation for the following distribution: X:, 4.5, 14.5, 24.5, 34.5, 44.5, 54.5, 64.5

f: , 1, 5, 12, 22, 17, 9, 4

24. Find the standard deviation for the following data: (i) x :

, 3, 8, 13, 18, 23 f : , 7, 10, 15, 10, 6

25. Calculate the mean and standard deviation for the following distribution: Marks:, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, 80-90 No. of students:, 3, 6, 13, 15, 14, 5, 4

26. Let $x_1, x_2, , x_n$ be x_n observations. Let $y_i = ax_i + b$ for i=1,2,...,n where a and b are constants. If the mean of x_i's is 48 and their standard deviation is 12, the mean of y_i's is 55 and standard deviation of y_i's is 15, the values of a and b are (a) $a = 1.25, b = -5$ (b) $a = -1.25, b = 5$ (c) $a = 2.5, b = -5$ (d) $a = 2.5, b = 5$

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27. For a frequency distribution standard deviation is computed by applying the formula (a)

$$\sigma = \sqrt{\frac{\sum fd^2}{\sum f} - \left(\frac{\sum fd}{\sum f}\right)^2}$$

(b)

$$\sigma = \sqrt{\left(\frac{\sum fd}{\sum f}\right)^2 - \frac{\sum fd^2}{\sum f}}$$

(c) $\sigma = \sqrt{\frac{\sum fd^2}{\sum f} - \frac{\sum fd}{\sum f}}$

(d) $\sigma = \sqrt{\left(\frac{\sum fd}{\sum f}\right)^2 - \frac{\sum fd^2}{\sum f}}$

28. The mean of 100 numbers observations is 50 and their standards deviation is 5. The sum of all squares of all the observations is (a)50,000 (b) 250,000 (c) 252500 (d) 255000

29. If $n = 10, X = 12$ and $\sum x_i^2 = 1530$, then the coefficient of variation is (a) 36% (b) 41% (c) 25% (d) none of these

30. Life of bulbs produced by two factories A and B are given below: Length of life (in hours): 550-650 650-750 750-850 850-950 950-1050 Factory A: (Number of bulbs) 10 22 52 20 16 Factory B(Number of bulbs) 8 60 24 16 12

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31. If the standard deviation of a variable X is σ , then standard deviation of variable $\dfrac{aX + b}{c}$ is (a) $a\sigma$ (b) $\dfrac{a}{c}\sigma$ (c) $\left|\dfrac{a}{c}\right|\sigma$ (d) $\dfrac{a\sigma + b}{c}$

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32. Following are the marks obtained, out of 100, by two students Ravi and Hashina in 10 life? Ravi: 25 50 45 30 70 42 36 48 35 60 Hashina: 10 70 50 20 95 55 42 60 48 80 .Who is more intelligent and who is more consistent?

33. 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) $\dfrac{s}{k}$

34. The lengths (in cm) of 10 rods in a shop are given below:

40.0,52.3,55.2,72.9,52.8,79.0,32.5,15.2,27.9,30.2   Find   mean deviation from median (ii) find mean deviation from the mean also.

35. If the S.D. of a set of observations is 8 and if each observation is divided by -2, the S.D. of the new set of observations will be (a) -4   (b) -8   (c) 8   (d) 4

36. The standard deviation of the observations 6,5,9,13,12,8,10 is 6 (b) $\sqrt{6}$ (c) $\dfrac{52}{7}$ (d) $\sqrt{\dfrac{52}{7}}$

37. The standard deviation of first 10 natural numbers is (a) 8.25 (b) 6.5 (c) 3.87 (d) 2.87

38. The mean deviation of the data 3,10,10,4,7,10,5 (a) 2 (b) 2.57(c)3 (d) 3.57

39. The mean deviation from e median is (a) equal to that measured from another value (b) maximum if all observations are positive (c) greater than that measured from any other value. (d) less than that measured form any other value.

40. The weight of coffee in 70 jars is shown in the following table: Weight (in grams): $200 - 201$ $201 - 202$ $202 - 203$ $203 - 204$ 204-205 205-206 $Frequency$ 13 27 18 10 1 1 Determine the variance and standard deviation of the above distribution.

41. Find the mean and variance of frequency distribution given below: x_i: $1 \leq x < 3$ $3 \leq x < 5$ $5 \leq x < 7$ $7 \leq x < 10$ f_i: 6 4 5 1

42. While calculating eh mean and variance of 10 readings, a student wrongly used the reading of 52 for the correct reading 25. He obtained the mean and variance as 45 and 16 respectively. Find the correct mean and the variance.

43. Mean and standard deviation of 100 observations were found to be 40 and 10 respectively. If at the time of

calculation two observations were wrongly taken as 30 and 70 in place of 3 and 27 respectively. Find the correct standard deviation.

44. Calculate the mean and standard deviation for the following data: Wages upto (into Rs.) 15 30 45 60 75 90 105 120 No. of workers 12 30 65 107 157 202 222 230

45. The following table gives the distribution of income of 100 families in a village. Calculate the standard deviation:

Income Rs. 0-1000 1000-2000 2000-3000 3000-4000 4000-5000 5000-6000 No. of Families 18 26 30 12 10 4

46. Calculate the mean and standard deviation for the following table given the age distribution of a group of people: Age: 20-30 30-40 40-50 50-60 60-70 70-80 80-90 No. of persons: 3 51 122 141 130 51 2

47. The measurements of the diameters (in mm) of the heads of 107 screws are given below: Diameter (in mm) 33-35

36-38 39-41 42-44 45-47 No. of screws 10 19 23 21 27. calculate mean diameter of head of screw.

48. The mean deviation of the numbers 3, 4, 5, 6, 7 from the mean is (a) 25 (b) 5 (c) 1.2 (d) 0

49. A batsman scores run in 10 innings as 38,70,48,34,42,55,63,46,54 and 44. The mean deviation about mean is (a) 8.6   (b) 6.4   (c) 10.6   (d) 7.6

50. The mean deviation of the series $a, a + d, a + 2d, ... , a + 2n$ from its mean is (a) $\dfrac{(n + 1)d}{2n + 1}$ (b) $\dfrac{nd}{2n + 1}$ (c) $\dfrac{n(n + 1)d}{2n + 1}$ (d) $\dfrac{(2n + 1)d}{n(n + 1)}$

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51. The following the record of goals scored by team a in football session. Number of goals scored: 0 1 2 3 4 Number of matches: 1 9 7 5 3 For the team B, mean number of goals scored per match was 2 with a standard deviation 1.25 goals. Find which team may be considered more consistent?

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52. An analysis of monthly wages paid to the works of two firms A and B belonging to the same industry gives the following results: Firm A Firm B Number of workers 1000 1200 Average monthly wages Rs. 2800 Rs. 2800 Variance of distribution of wages 100 169 In which firm, A or B is there greater variability in individual wages?

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53. Let $x_1, x_2, \ldots\ldots, x_n$ be values taken by a variable X and $y_1, y_2, \ldots\ldots\ldots, y_n$ be the values taken by a variable Y such that $y_i = ax_i + b$,i=1,2,3....$Then$, (a)Var.(Y)=$a^2 Var$. (X) (b) $Var. (X) = a^2 Var. (Y)$ (c) $Var. (X) = Var. (X) + b$ (d) none of these

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54. The algebraic sum of deviations of 10 observations measured from 16 is 7. The mean is (a) 105 (b) 70 (c) 15.7 (d) None of these

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55. Calculate the mean deviation about median from the following data: 340, 150, 210, 240, 300, 310, 320.

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56. For a group of 200 candidates the mean and S.D. were found to be 40 and 15 respectively. Later on it was found

that the score 43 was misread as 34. Find the correct mean and correct S.D.

57. Find the mean deviation from the mean for the data: 6,7,10,12,13,4,8,20.

58. The scores of a batsman in ten innings are : 38,70,48,34,42,55,63,46,54,44. Find the mean deviation about the median.

59. Calculate the mean deviation about the mean of the set of first n natural numbers when n is even natural number.

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60. Calculate the mean deviation about the mean of the set of first n natural numbers when n is odd natural number.

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61. Find the variance and standard deviation of the following data 5,12,3,18,6,8,2,10

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62. Compute the variance and standard deviation of the following observations of marks of 5 students of a tutorial group: Marks out of 25:8,12,13,15,22

63. The number of telephone calls received at an exchange in 245 successive one-minute intervals are shown in the following frequency distribution: Number of calls 0 1 2 3 4 5 6 7 Frequency 14 21 25 43 51 40 39 12

64. Calculate mean deviation from the median for the following distribution: x_i : 10 15 20 25 30 35 40 45 f_i : 7 3 8

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65. The mean deviation for n observations $x_1, x_2, \ldots\ldots, x_n$ from their mean X is given by (a) $\sum_{i=1}^{n} (x_i - X)$ (b) $\frac{1}{n}\sum_{i=1}^{n} (x_i - X)$ (c) $\sum_{i=1}^{n} (x_i - X)^2$ (d) $\frac{1}{n}\sum_{i=1}^{n} (x_i - X)^2$

66. Let $x_1, x_2, \ldots\ldots, x_n$ be n observations, and let $\bar{x}$ be their arithematic mean and σ^2 be their variance. Statement 1: Variance of $2x_1, 2x_2, \ldots\ldots, 2x_n is 4\sigma^2$. Statement 2: Arithmetic mean of $2x_1, 2x_2, \ldots\ldots, 2x_n is 4x$. (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

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67. The scores of a batsman in 10 matches were as follows: 38,70,48,34,42,55,63,46,54,44 compute the variance and standard deviation.

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68. The mean and variance of 7 observation is 8 and 16. If five of the observations are 2, 4, 10, 12, 14. Find the remaining

two observations.

69. If for a sample of size 60, we have the following information $\sum x_i^2 = 18000$ and $\sum x_i = 960$, then the variance is (a) 6.63 (b) 16 (c) 22 (d) 44

70. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the

following cases. (i)　　If wrong item is omitted (ii)　　If it is replaced by 12.

71. 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

72.　If　for　distribution　of　18　observations

$$\sum (x_i - 5) = 3 and \sum (x_i - 5)^2 = 43,$$ find the mean and standard deviation.

73. If the men and standards deviation of 100 observations are 50 and 4 respectively. Find the sum of all the observations and the sum of their squares.

74. Let $x_1, x_2, \ldots, x_n$ values of variable X and let $'a'$ be non zero real number. Then prove that the variance of the observations $ax_1, ax_2, \ldots, ax_n$ is a^2 Var (X) . Also, find their standard deviation.

75. If two variates X and Y are connected by the relation $Y = \dfrac{aX + b}{c}$,where a, b, c are constants such that $ac < 0, then$ (a) $\sigma_\gamma = \dfrac{a}{c}\sigma_X$ (b) $\sigma_\gamma = -\dfrac{a}{c}\sigma_X$ (c) $\sigma_\gamma = \dfrac{a}{c}\sigma_X + b$ (d) none of these

76. Let $x_1, x_2, x_3, ,$ be n values of a variable X. If these values are changed to $x_1 + a, x_2 + a, ... , x_n + a, where a \in R,$ show that the variance remains unchanged.

77. If for a sample of size 60, we have the following information $\sum x_i^2 = 18000$ and $\sum x_i^2 = 960$, then the variance is (a) 6.63 (b) 16 (c) 22 (d) 44

78. The weight of coffee in 70 jars is shown in the following table: Weight (in grams):, $200 - 201$, $201 - 202$, $202 - 203$, $203 - 204$, 204-205, 205-206 $Frequency$, 13, 27, 18, 10, 1, 1 Determine the variance and standard deviation of the above distribution.

79. Suppose that samples of polythene bags from two manufacturers, A and B, are tested by a prospective buyer for bursting pressure, with the following results. Bursting Pressure in kg, Number of bags manufactured by manufacturer 5-10, 2, 9 10-15, 9, 11 15-20, 29, 18 20-25, 54, 32 25-30, 11, 27 30-35, 5, 13 Which set of the bags has the highest average brusting pressure?

80. Let $x_1, x_2, \ldots\ldots, x_n$ be values taken by a variable X and $y_1, y_2, \ldots\ldots\ldots, y_n$ be the values taken by a variable Y such that $y_i = ax_i + b, i = 1, 2, , n.$ Then, (a) $Var(Y) = a^2 Var(X)$ (b) $Var(X) = a^2 Var(Y)$ (c) $Var(X) = Var(X) + b$ (d) none of these

81. The sum of the squares of deviation of 10 observations

from their mean 50 is 250,then coefficient of variation is

82. If the S.D. of a set of observations is 8 and if each

observation is divided by -2, the S.D. of the new set of

observations will be (a) -4   (b) -8   (c) 8   (d)

4

83. Find the mean and variance of frequency distribution given below: x_i: , $1 \le x < 3$, $3 \le x < 5$, $5 \le x < 7$, $7 \le x < 10$ f_i: , 6, 4, 5, 1

84. The mean deviation of the series $a, a + d, a + 2d, , a + 2n$ from its mean is $\dfrac{(n+1)d}{2n+1}$ (b) $\dfrac{nd}{2n+1}$ (c) $\dfrac{n(n+1)d}{2n+1}$ (d) $\dfrac{(2n+1)d}{n(n+1)}$

85. The standard deviation of the data: x: , 1, a , a^2 , ..., a^n f: , $^\wedge nC_0$, $^\wedge nC_1$, $^\wedge nC_2$, ..., $^\wedge nC_n$ is

$$\left(\frac{1+a^2}{2}\right)^n - \left(\frac{1+a}{2}\right)^{2n}$$ (b)

$$\left(\frac{1+a^2}{2}\right)^{2n} - \left(\frac{1+a^2}{2}\right)^{2n}$$ (c)

$$\left(\frac{1+a}{2}\right)^{2n} - \left(\frac{1+a^2}{2}\right)^n$$ (d) none of these

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86. The mean deviation of the numbers 3,4,5,6,7 from the mean is(a) 25 (b) 5 (c) 1.2 (d) 0

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87. A batsman scores run in 10 innings as 38,70,48,34,42,55,63,46,54 and 44. The mean deviation about mean is 8.6 (b) 6.4 (c) 10.6 (d) 7.6

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88. The scores of a batsman in 10 matches were as follows:

38,70,48,34,42,55,63,46,54,44 compute the variance and standard deviation.

89. Calculate mean for the following data: x_i: 3 9 17 23 27

f_i: 8 10 12 9 5

90. Calculate the mean and standard deviation for the following data: Wages upto (into Rs.), 15, 30, 45, 60, 75, 90,

105, 120 No. of workers, 12, 30, 65, 107, 157, 202, 222, 230

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91. The following table gives the distribution of income of 100 families in a village. Calculate the standard deviation:

Income Rs., 0-1000, 1000-2000, 2000-3000, 3000-4000, 4000-5000, 5000-6000 No. of Families, 18, 26, 30, 12, 10, 4

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92. While calculating mean and variance of 10 readings, a student wrongly used the reading of 52 for the correct reading 25. He obtained the mean and variance as 45 and 16 respectively. Find the correct mean and the variance.

93. Mean and standard deviation of 100 observations were found to be 40 and 10 respectively. If at the time of calculation two observations were wrongly taken as 30 and 70 in place of 3 and 27 respectively. Find the correct standard deviation.

94. The number of telephone calls received at an exchange in 245 successive one-minute intervals are shown in the following frequency distribution: Number of calls, 0, 1, 2, 3, 4, 5, 6, 7 Frequency, 14, 21, 25, 43, 51, 40, 39, 12 Calculate mean deviation about Median.

95. Calculate mean deviation from the median for the following distribution: x_i: , 10, 15, 20, 25, 30, 35, 40, 45 f_i: , 7, 3, 8, 5, 6, 8, 4, 9

96. Find the variance and standard deviation for the following data: 4,6,10,12,14,18,20

97. Complete the variance and standard deviation of the following observations of marks of 5 students of a tutorial

group: Marks out of 25:8,12,13,15,22

98. Calculate the mean deviation about the mean of the set

of first n natural numbers when n is even natural number.

99. Let $x_1, x_2, x_3, ,$ be n values of a variable X. If these

values   are   changed   to

$x_1 + a, x_2 + a, ... , x_n + a, where a \in R,$ show that the

variance remains unchanged.

100. Find the mean deviation from the mean for the data:

6,7,10,12,13,4,8,20.

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101. The scores of a batsman in ten innings are :

38,70,48,34,42,55,63,46,54,44. Find the mean deviation about

the median.

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102. Calculate the mean deviation about median from the

following data: 340, 150, 210, 240, 300, 310, 320.

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103. For a group of 200 candidates the mean and S.D. were found to be 40 and 15 respectively. Later on it was found that the score 43 was misread as 34. Find the correct mean and correct S.D.

104. The mean deviation from e median is a.equal to that measured from another value b.maximum if all observations are positive c,greater than that measured from any other value. d,less than that measured form any other value.

105. Calculate the mean deviation about the mean of the set of first n natural numbers when n is odd natural number.

106. Let x_1, x_2, ... , x_n values of variable X and let $'a'$ be non zero real number. Then prove that the variance of the observations ax_1, ax_2, ..., ax_n is a^2 Var (X) . Also, find their standard deviation.

107. Life of bulbs produced by two factories A and B are given below: Length of life (in hours):, 550-650, 650-750, 750-

850, 850-950, 950-1050 Factory A: (Number of bulbs), 10, 22, 52, 20, 16 Factory B(Number of bulbs), 8, 60, 24, 16, 12 The bulbs of which factory are more consistent from the point of view of length of life?

108. If for distribution of 18 observations $\sum (x_i - 5) = 3 and \sum (x_i - 5)^2 = 43,$ find the mean and standard deviation.

109. If the men and standards deviation of 100 observations are 50 and 4 respectively. Find the sum of all the

observations and the sum of their squares.

110. Find the standard deviation for the following data: (i) $x:$, 3, 8, 13, 18, 23 $f:$, 7, 10, 15, 10, 6 (ii) $x:$, 2, 3, 4, 5, 6, 7, 7 $f:$, 4, 9, 16, 14, 11, 6, 6

111. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the

following cases. (i)   If wrong item is omitted (ii)   If it is

replaced by 12.

112. For a frequency distribution mean deviation from mean in computed by (a) $M\dot{D} = \dfrac{\sum f}{\sum f|d|}$ (b) $M\dot{D} = \dfrac{\sum d}{\sum f}$ (c) $M\dot{D} = \dfrac{\sum fd}{\sum f}$ (d) $M\dot{D} = \dfrac{\sum f|d|}{\sum f}$

113. Calculate the mean and standard deviation for the

following distribution: Marks:, 20-30, 30-40, 40-50, 50-60, 60-

70, 70-80, 80-90 No. of students:, 3, 6, 13, 15, 14, 5, 4

114. The measurements of the diameters (in mm) of the heads of 107 screws are given below: Diameter (in mm), 33-35, 36-38, 39-41, 42-44, 45-47 No. of screws, 10, 19, 23, 21, 27. Find the mean diameter.

115. 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 s (b) ks (c) $s + k$ (d) $\dfrac{s}{k}$

116. If $n = 10$, $X = 12 and \sum x^2 = 1530$, then the coefficient of variation is (a) 36% (b) 41% (c) 25% (d) none of these

117. The mean deviation for n observations $x_1, x_2, \ldots\ldots\ldots, x_n$ from their mean X is given by (a) $\sum_{i=1}^{n} (x_i - X)$ (b) $\frac{1}{n} \sum_{i=1}^{n} |x_i - X|$ (c) $\sum_{i=1}^{n} (x_i - X)^2$ (d) $\frac{1}{n} \sum_{i=1}^{n} (x_i - X)^2$

118. The standard deviation of the observations 6,5,9,13,12,8,10

is (a)6 (b) $\sqrt{6}$ (c) $\dfrac{52}{7}$ (d) $\sqrt{\dfrac{52}{7}}$

119. If the standard deviation of a variable X is σ , then standard deviation of variable $\dfrac{aX + b}{c}$ is (a) $a\sigma$ (b) $\dfrac{a}{c}\sigma$ (c) $\left|\dfrac{a}{c}\right|\sigma$ (d) $\dfrac{a\sigma + b}{c}$

120. Following are the marks obtained, out of 100, by two students Ravi and Hashina in 10 life? Ravi: 25 50 45 30 70 42

36 48 35 60 Hashina: 10 70 50 20 95 55 42 60 48 80 .Who is more intelligent and who is more consistent?

121. 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. 4.87

Answer: null

122. The mean of 100 numbers observations is 50 and their standards deviation is 5. The sum of all squares of all the observations is (a)50,000   (b) 250,000   (c) 252500   (d) 255000

123. The following is ht record of goals scored by team A in a football session   For the team b, mean number of goals scored per match was 2 with a standard deviation 1.25 goals. Find which team may be considered more consistent?

124. The standard deviation of first 10 natural numbers is (a) 8.25 (b) 6.5 (c) 3.87 (d) 2.87

125. Let $x_1, x_2, , x_n$ be x_n observations. Let $y_i = ax_i + b$ for i=1,2,...,n where a and b are constants. If the mean of $x_i's$ is 48 and their standard deviation is 12, the mean of $y_i's$ is 55 and standard deviation of $y_i's$ is 15, the values of a and b are (a) $a = 1.25, b = -5$ (b) $a = -1.25, b = 5$ (c) $a = 2.5, b = -5$ (d) $a = 2.5, b = 5$

126. Let $x_1, x_2, ..., x_n$ be n observations and $\overline{X}$ be their arithmetic mean. The standard deviation is given by (a)

$$\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2 \qquad \text{(b)} \qquad \frac{1}{n} \sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2 \qquad \text{(c)}$$

$$\sqrt{\frac{1}{n} \sum_{i=1}^{n} \left(x_i - X\right)^2} \text{ (c) } \frac{1}{n} \sum_{i=1}^{n} x_i^2 - \overline{X}^2$$

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127. The following are some particulars of the distribution of weights of boys and girls in a class: Boys Girls Number 100 50 Mean 60kg 45kg Variance 9 4 Which of the distributions is more variable?

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128. 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) 3.57

129. There are 60 students in a class. The following is the frequency distribution of marks obtained by the students in a test: Marks:, 0, 1, 2, 3, 4, 5 Frequency , $x - 2$, x , x^2 , $(x+1)^2$, $2x$, $x + 1$. Determine mean and standard deviation of the marks.

130. Find the mean deviation about median for the following data :

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Number of Girls	6	8	14	16	4	2

131. The following table gives the number of finished articles turned out per day be different number of workers in a factors. Find the standard deviation of the daily output of finished articles. Find the variance and standard deviation of the following frequency distribution: Number of article:, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 No. of workers:, 3, 7, 11, 14, 18, 17, 13, 8, 5, 4

132. If a is positive integer and the frequency distribution:

$x:$, A, 2a, 3a, 4a, 5a, 6a $f:$, 2, 1, 1, 1, 1, 1 and variance is 160 then find the value of a.

133. Calculate the mean deviation about median age for the age distribution of 100 persons given below: Age   16-20

21-25   26-30   31-35   36-40   41-45   46-50   51-55

Number   5   6   12   14   26   12

16   9

134. Calculate mean deviation from the median of the following data: Class interval: 0-6 6-12 12-18 18-24 24-30 Frequency 4 5 3 6 2

135. Find the mean of first n terms of an A.P. whose first term is a and common difference is d.

136. Find the variance and standard deviation of the following frequency distribution: Variable (x_i) , 2, 4, 6, 8, 10, 12, 14, 16 Frequency (f_i) , 4, 4, 5, 15, 8, 5, 4, 5

137. Calculate the mean deviation from the median of the following data: Wages per week (in Rs.), 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 No. of workers, 4, 6, 10, 20, 10, 6, 4

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138. Find the mean deviation from the mean of the following data: Classes:, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 frequency, 2, 3, 8, 14, 8, 3, 2

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139. Find the mean deviation about the mean for the following data: Marks obtained , 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80 Number of students, 2, 3, 8, 14, 8, 3, 2

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140. The age distribution of 100 life-insurance policy holders is as follows: Age (on nearest birthday), 17-19.5, 20-25.5, 26-35.5, 36-40.5, 41-50.5, 51-55.5, 56-60.5, 61-70.5 No. of persons, 5, 16, 12, 26, 14, 12, 6, 5

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141. Find the mean deviation from the mean for the following data: Size:, 20, 21, 22, 23, 24 frequency, 6, 4, 5, 1, 4

142. Find the mean deviation from the mean for the following data: Size: 1 3 5 7 9 11 13 15 Frequency: 3 3 4 14 7 4 3 4

143. Find the mean deviation from the median for the following data: Size:, 10, 11, 12, 14, 15 Frequency:, 2, 3, 8, 3, 4

144. Find the mean deviation about the median of the following frequency distribution: Class:, 0-6, 6-12, 12-18, 18-24, 24-30 Frequency:, 8, 10, 12, 9, 5

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145. Calculate the mean and standard deviation for the following table given the age distribution of a group of people: Age: 20-30 30-40 40-50 50-60 60-70 70-80 80-90 No. of persons: 3 51 122 141 130 51 2

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146. The lengths (in cm) of 10 rods in a shop are given below:

40.0,52.3,55.2,72.9,52.8,79.0,32.5,15.2,27.9,30.2   Find   mean deviation from median (ii) find mean deviation from the mean also.

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147. The mean and variance of 7 observations are 8 and 16, respectively. If five of the observations are 2, 4, 10, 12, 14. Find the remaining two observations.

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148. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following result and no. of workers of firm A and B are 586 and 648 respectively

	Firm A	Firm B
No. of wage earners	586	648
Mean of monthly wages	Rs 5253	Rs 5253
Variance of the distribution of wages	100	121

(i) Which firm A or B pays larger amount as monthly wages?

(ii) Which firm, A or B, show greater variability in individual wages?

149. From the data given below state which group is more variable G_1 or G_2? Marks, 10-20, 20-30, 30-40, 40-50, 50-60,

60-70, 70-80 Group G_1 , 9, 17, 32, 33, 40, 10, 9 Group G_2 , 10, 20, 30, 25, 43, 15, 7

150. From the prices of shares X and Y below, find out which is more stable in value X 35 54 52 53 56 58 52 50 51 49 . Y 108 107 105 105 106 107 104 103 104 101

151. If two variates $X and Y$ are connected by the relation $Y = \dfrac{aX + b}{c}, where a, b, c$ are constants such that $ac < 0, then$ (a) $\sigma_\gamma = \dfrac{a}{c}\sigma_X$ (b) $\sigma_\gamma = -\dfrac{a}{c}\sigma_X$ (c) $\sigma_\gamma = \dfrac{a}{c}\sigma_X + b$ (d) none of these

152. Calculate the variance and standard deviation from the data given below: Size of item, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5 Frequency , 3, 7, 22, 60, 85, 32, 8

153. Find the variance and standard deviation for the following distribution: X:, 4.5, 14.5, 24.5, 34.5, 44.5, 54.5, 64.5 f: , 1, 5, 12, 22, 17, 9, 4

154. Calculate the mean deviation about the median of the following observation: 3011,2780,3020,2354,3541,4150,5000

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155. The scores of a batsman in ten innings are : 38,70,48,34,42,55,63,46,54,44. Find the mean deviation about the median.

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156. Calculate the mean deviation about median of the following data: 34, 66, 30, 38, 44, 50, 40, 60, 42, 51

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157. Calculate the mean deviation about the median of the following observation:22,24,30,27,29,31,25,28,41,42

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158. Calculate the mean deviation about the median of the following observation: 38,70,48,34,63,42,55,44,53,47

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159. Calculate the mean deviation about mean of the following data.(i) 1, 4, 7, 8, 9,10, 12, 13, 17

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160. Calculate the mean deviation from the mean for the following data:13,17,16,14,11,13,10,16,11,18,12,17

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161. Calculate the mean deviation from the mean for the following data:38,70,48,40,42,55,63,46,54,44

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162. Calculate the mean deviation from the mean for the following data:36,72,46,42,60,45,53,46,51,49

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163. Calculate the mean deviation from the mean for the following data:57,64,43,67,49,59,44,47,61,59

164. Calculate the mean deviation of the following income groups of five and seven members from their medians: 1st income group (in Rs.): 4000 4200 4400 4600 4800 2nd income group (in Rs.): 3800 4000 4200 4400 4600 4800 5800

165. Calculate the mean deviation from the median of the following frequency distribution:5 7 9 11 13 15 17 2 4 6 8 10 12

8

166. Calculate the mean deviation about the median of the following frequency distribution: 5 7 9 11 13 15 17 Having Frequency 2 4 6 8 10 12 8

167. Find the mean deviation from the mean for the following data: 5 2 9 10 12 15 8 6 2 2 2 6

168. Find the mean deviation from the median of the following data: 15 21 27 30 3 5 6 7

169. Compute the mean deviation from the median of the following distribution: Class 0-10 10-20 20-30 30-40 40-50 Frequency 5 10 20 5 10

170. Find the mean deviation from the mean for the following data: Classes 0-100 100-200 200-300 300-400 400-500 500-600 600-700 700-800 Frequencies 4 8 9 10 7 5 4 3

171. Compute mean deviation from mean of the following distribution: Marks 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90 No. of students 8 10 15 2 20 18 9 5

172. Find the deviation from the mean and from median of the following distribution: Marks 0-10 10-20 20-30 30-40 40-50 No. of Students 5 8 15 16 6

173. Calculate the mean deviation about the mean for the following frequency distribution Class interval $0 - 4, 4 - 8, 8 - 12, 12 - 16, 16 - 20$ Frequency $4, 6, 8, 5, 2$

174. Let $x_1, x_2, ..., x_n$ values of variable X and let $'a'$ be non zero real number. Then prove that the variance of the observations $ax_1, ax_2, ..., ax_n$ is a^2 Var (X) . Also, find their standard deviation.

175. Calculate the mean and standard deviation of first n natural numbers.

176. Find the mean variance and standard deviation for the following data: 2,4,5,6,8,17

177. Find the mean, variance and standard deviation for the following data: 6,7,10,12,13,4,8,12

178. Find the mean, variance and standard deviation for the following data: 227,235,255,269,292,299,312,321,333,348

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179. The variance of 20 observations is 5. If each observation is multiplied by 2 find the variance of the resulting observations.

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180. The variance of 15 observations is 4. If each observations increased by 9 find the variance of the resulting observations.

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181. The mean of 5 observations is 4.4 and their variance is 8.24. If three of the observations are 1, 2 and 6, find the other two observations.

182. The mean and standard deviation of six observations are 8 and 4, respectively. If each observation is multiplied by 3, find the new mean and new standard deviation of the resulting observations.

183. The mean and variance of eight observations are 9 and 9.25, respectively. If six of the observations are 6, 7, 10, 12, 12 and 13, find the remaining two observations.

184. For a group of 200 candidates, mean was found to 40 but it was discovered later that the scores of 43 and 35 were misread as 34 and 53 respectively. Then the correct mean is

185. The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who

took by mistake 50 instead of 40 for one observation. What are the correct mean and standard deviation?

186. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the following cases. (i) If wrong item is omitted (ii) If it is replaced by 12.

187. The mean and standard deviation of a group of 100 observations were found to be 20 and 3, respectively. Later on it was found that three observations were incorrect, which are recorded as 21, 21 and 18. Find the mean and standard deviation if the incorrect observations are omitted.

188. Show that the two formulae for the standard deviation of ungrouped data: $\sigma = \sqrt{\dfrac{1}{n}\sum (x_i - \overline{X})^2}$ and $\sigma' = \sqrt{\dfrac{1}{n}\sum x_i^2 - \overline{X}^2}$ are equivalent where $\overline{X} = \dfrac{1}{n}\sum x_i.$

189. Find the variance and standard deviation for the following distribution: X:, 4.5, 14.5, 24.5, 34.5, 44.5, 54.5, 64.5

f: , 1, 5, 12, 22, 17, 9, 4

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190. Table below shows the frequency f with which x alpha particles were radiated from a diskette x: 0 1 2 3 4 5 6 7 8 9 10 11 12 f: 51 203 383 525 532 408 273 139 43 27 10 4 2. Calculate the mean and variance

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191. Calculate the mean and S.D for the following data: Expenditure (in Rs.) 0-10 10-20 20-30 30-40 40-50 Frequency:

14 13 27 21 15

192. Calculate the standard deviation for the following data:

Class 0-30 30-60 60-90 90-120 120-150 150-180 180-210

Frequency: 9 17 43 82 81 44 24

193. The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who took by mistake 50 instead of 40 for one observation. What are the correct mean and standard deviation?

194. Calculate the mean, median and standard deviation of the following distribution: Class interval 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 Frequency: 2 3 8 12 16 5 2 3

195. Calculate mean, variance and standard deviation of the following frequency distribution: Class 1-10 10-20 20-30 30-40 40-50 0-60 Frequency: 11 29 18 4 5 3

196. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the

following results: Firm A Firm B No. of wages earners 586 684 Mean of monthly wages Rs. 5253 Rs. 5253 Variance of the distribution of wages 100 121 Which firm A or B pays to larger mount as monthly wages? Which firm A or B shows greater variability in individual wages?

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197. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following results: Firm A Firm B No. of wage earners 586 648 Mean of monthly wages Rs 5253 Rs 5253 Variance of the distribution of wages 100 121 (i) Which firm A or B pays larger amount as monthly wages? (ii) Which firm, A or B, shows greater variability in individual wages?

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198. The following values are calculated in respect of heights and weights of the students of a section of class XI: Height Weight Mean 162.6 cm 52.36 kg Variance 127.69cm2 23.1361 kg2 Can we say that the weights show greater variation than the heights?

199. If the heights of 5 persons are 140 cm, 150cm,158cm, 152 cm and 161 cm respectively. Find the mean height.

200. The sum and sum of squares corresponding to length x (in cm) and weight y (in gm) of 50 plant products are given below :

$$\sum_{i=1}^{50} x_i = 212, \; \sum_{i=1}^{50} x_i^2 = 902.\,8, \; \sum_{i=1}^{50} y_i = 261, \; \sum_{i=1}^{50} y_i^2 = 1457.\,6$$

Which is more varying, the length or weight?

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201. Two plants A and B of a factory show following results about the number of workers and the wages paid to them. Plant A Plant B No. of workers 5000 6000 Average monthly wages Rs. 2500 Rs. 2500 Variance of distribution of wages 81 100 In which plant A or B is there greater variability in individual wages?

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202. find the mean salary of 60 workers of a factory from the given table

203. The means and standard deviations of heights ans weights of 50 students of a class are as follows: Weights Heights Mean 63.2 kg 63.2 inch Standard deviation 5.6 kg 11.5 inch Which shows more variability, heights or weights?

204. The means and standard deviations of heights ans weights of 50 students of a class are as follows: Weights Heights Mean 63.2 kg 63.2 inch Standard deviation 5.6 kg 11.5 inch Which shows more variability, heights or weights?

205. Coefficient of variation of two distributions are 60% and 70% and their standard deviations are 21 and 16 respectively. What are their arithmetic means?

206. Calculate coefficient of variation from the following data: Income (in Rs.) 1000-1700 1700-2400 2400-3100 3100-3800 3800-4500 4500-5200 No. o families 12 18 20 25 35 10

207. An analysis of the weekly wages paid to workers in two firms A and B, belonging to the same industry gives the following results;   Firm A Firm B No. of wages earners 586 648 Average weekly wages Rs. 2. Rs. 47.5 Distribution of wages 100 121 Which firm A or B pays out larger amount as weekly wages? Which firm A or B has greater variability in individual wages?

208. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following results: Firm A Firm B No. of wage earners 586 648 Mean of monthly wages Rs 5253 Rs 5253 Variance of the distribution of wages 100 121 (i) Which firm A or B pays larger amount as monthly wages? (ii) Which firm, A or B, shows greater variability in individual wages?

209. The mean and standard deviation of marks obtained by 50 students of a class in there subjects, mathematics, physics and chemistry are given below: Subject Mathematics Physics Chemistry Mean 42 32 40.9 Standard Deviation 12 15

20 Which of the three subjects shows the highest variability in marks and which shows the lowest?

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210. Find the coefficient of variation for the following data:

Size (in cms) 10-15 15-20 20-25 25-30 30-35 35-40 No. of items

2 8 20 35 20 15

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211. The variance of first n natural number is:

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212. If the sum of the squares of deviations for 10 observations taken from their means is 2.5, then write the value of standard deviation.

213. If $x_1, x_2, , x_n$ are n values of a variable X and $y_1, y_2, \ldots, yn$ are n values of variable Y such that $y_i = ax_i + b, i = 1, 2, \ldots, n$ then write $Var(Y)$ in terms of $Var(X)$

214. In a series of 20 observations, 10 observation each equal to k and each of the remaining half is equal to $-k$. If the standard deviation of the observations is 2, then write the value of k.

215. If each observation of a dist., whose variance is σ^2 , is multiplied by λ, then the S.D. of the new observations is

216. If a variable X takes values of $0, 1, 2, \ldots n$ with frequencies $^nC_0, \ ^nC_1, \ ^nC_2, \ \ldots, \ ^nC_n,$ then variance of

distribution is

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