MATHS

BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

STATISTICS

Multiple Choice Questions Level I

1. 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

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2. The mean deviation of the data 2, 9, 9, 3, 6, 9, 4 from the mean is

:

A. 2.23

B. 2.57

C. 3.23

D. 3.57

Answer: B

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3. Mean deviation for n observations $x_1, x_2, \ldots, x_n$ from their mean $\bar{x}$ is given by :

A. $\displaystyle\sum_{i-1}^{n} (x_i - \bar{x})$

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

C. $\displaystyle\sum_{i=1}^{n} (x_i - \bar{x})^2$

D. $\displaystyle\frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^2$

Answer: B

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4. 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: C

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5. Following are the marks obtained by 9 students 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

6. The standard deviation of the data 6, 5, 9, 13, 12, 8, 10 is :

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

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

C. $\sqrt{6}$

D. 6

Answer: A

7. Let $x_1, x_2, \ldots, x_n$ be n observations and x be their arithmetic mean. The formula for the standard deviation is given by :

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

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

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

D. $\sqrt{\dfrac{\sum x_i^2}{n} + x^{-2}}$

Answer: C

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

A. 50000

B. 250000

C. 252500

D. 255000

Answer: C

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9. Let a, b, c, d, e be the observations with mean 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. $\dfrac{s}{k}$

Answer: A

10. 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. $\dfrac{s}{k}$

C. ks

D. s

Answer: C

11. Let $x_1, x_2, \ldots, x_n$ be n observations. Let $w_i = lx_i + k$ for l = 1, 2,...., n, where l and k are constants. If the mean of x_i's is 48 and their standard deviation is 12, the mean of w_i's is 55 and standard deviation of w_i's is 15, the values of l and k should be

    A. l = 1.25, k = - 5

    B. l = - 1.25, k = 5

    C. l = 2.5, k = - 5

    D. l = 2.5, k = 5

Answer: A

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12. Standard deviations for first 10 natural numbers is :

    A. 5.5

B. 3.87

C. 2.97

D. 2.87

Answer: D

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13. 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

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

A. 8.25

B. 6.5

C. 3.87

D. 2.87

Answer: A

15. The following information relates to a sample of size 60 :

$\sum x^2 = 18000, \sum x = 960.$ The variance is :

A. 6.63

B. 16

C. 22

D. 44

Answer: D

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16. 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

Answer: A

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17. Variance of the data 2, 4, 5, 6, 8, 17 is 23.33. Then variance of 4, 8, 10, 12, 16, 34 is :

A. 23.23

B. 25.33

C. 46.66

D. 48.66

Answer: C

18. A set of n values $x_1, x_2, \ldots, x_n$ has standard deviation σ. The standard deviation of n values : $x_1 + k, x_2 + k, \ldots, x_n + k$ will be :
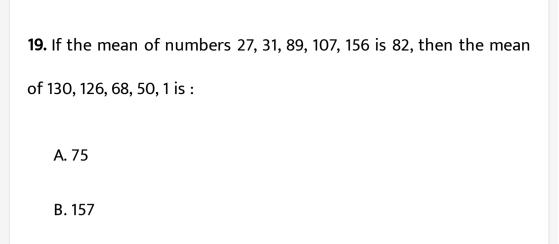
A. σ

B. $\sigma + k$

C. $\sigma - k$

D. $k\sigma$

Answer: A

19. If the mean of numbers 27, 31, 89, 107, 156 is 82, then the mean of 130, 126, 68, 50, 1 is :

A. 75

B. 157

C. 82

D. 80

Answer: A

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20. The median of 10, 14, 11, 9, 8, 12, 6 is :

A. 10

B. 12

C. 14

D. 11

Answer: A

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21. The mean of a set of numbers is $\bar{x}$. If each number is increased by λ, then mean of the new set is :

A. $\bar{x}$

B. $\bar{x} + \lambda$

C. $\lambda \bar{x}$

D. None of these

Answer: B

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22. Which of the following is not a measure of central tendency :

A. Mean

B. Median

C. Mode

D. Range

Answer: B

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23. The weighted mean of first n natural numbers whose weights are equal to the squares of corresponding numbers is :
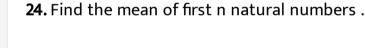
A. $\dfrac{n+1}{2}$

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

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

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

Answer: B

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24. Find the mean of first n natural numbers .

A. $\dfrac{n(n+1)}{2}$

B. n (n + 1)

C. $\dfrac{n+1}{2}$

D. n + 1

Answer: C

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25. A group of 10 items has mean 6. If the mean of 4 of these items is 7.5, then the mean of the remaining items is :

A. 6.5

B. 5.5

C. 4.5

D. 5.0

Answer: C

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26. The mean of a set of observations is $\bar{x}$. If each observation is divided by α, $\alpha \neq 0$ and then is increased by 10, then the mean of the new set is :

A. $\dfrac{\bar{x}}{\alpha}$

B. $\dfrac{\bar{x} + 10}{\alpha}$

C. $\dfrac{\bar{x} + 10\alpha}{\alpha}$

D. $\alpha\bar{x} + 10$

Answer: C

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27. The mode of the distribution :

Marks	4	5	6	7	8
No. of students	6	7	10	8	3

is :

A. 5

B. 6

C. 8

D. 10

Answer: B

28. The standard deviation for the set of numbers 1, 4, 5, 7, 8 is 2.45 nearly. If 10 are added to each number, then the new standard deviation will be :

A. 2.45 nearly

B. 24.45 nearly

C. 0.245 nearly

D. 12.45 nearly

Answer: A

29. Let S be the standard deviation of n observations. Each of the n observations is multiplied by a constant c. Then the standard deviation of the resulting numbers is :

A. S

B. cS

C. $S\sqrt{c}$

D. None of these

Answer: B

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

A. $\dfrac{7}{2}, \sqrt{\dfrac{35}{12}}$

B. $\dfrac{7}{2}, \sqrt{3}$

C. 3, 3

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

Answer: A

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31. The coefficient of variation is computed by :

A. $\dfrac{\text{Mean}}{\text{S.D.}}$

B. $\dfrac{\text{S.D.}}{\text{Mean}}$

C. $\dfrac{\text{S.D.}}{\text{Mean}} \times 100$

D. $\dfrac{\text{Mean}}{\text{S.D.}} \times 100$

Answer: C

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32. If each observation of a raw data, whose variance is σ^2 is multiplied by λ, then the variance of the new set is :

A. σ^2

B. $\lambda^2 \sigma^2$

C. $\lambda + \sigma^2$

D. $\lambda^2 + \sigma^2$

Answer: B

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33. The quartile deviation of daily wages (in Rs.) of 7 persons is given below : 12, 7, 15, 10, 17,19, 25 is :

A. 14.5

B. 5

C. 9

D. 4.5

Answer: D

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34. The number of ovservations in a group is 40. If the average of first 10 is 4.5 and that of the remaining 30 is 3.5, then the average of the whole group is :

A. $\dfrac{1}{5}$

B. $\dfrac{15}{4}$

C. 6

D. 8

Answer: B

35. The S.D. of 5 scores 1, 2, 3, 4, 5 is :

A. $\dfrac{2}{5}$

B. $\dfrac{3}{5}$

C. $\sqrt{2}$

D. $\sqrt{3}$

Answer: C

36. A set of numbers consists of three 4's, five 5's, six 6's and eight 8's and seven 10's. The mode of this set of numbers is :

A. 6

B. 7

C. 8

D. 10

Answer: C

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37. A car completes the first half of its journey with a velocity v_1 and the rest half with a velocity v_2. Then the average velocity of the car for the whole journey is :

A. $\dfrac{v_1 + v_2}{2}$

B. $\sqrt{v_1 v_2}$

C. $\dfrac{2v_1 v_2}{v_1 + v_2}$

D. None of these

Answer: C

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38. If the mode of a data is 18 and the mean is 24, then median is :

A. 21

B. 24

C. 22

D. 18

Answer: C

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39. Geometric mean of $2, 2^2, 2^3, \ldots, 2^n$ is :

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

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

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

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

Answer: A

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40. The geometric mean of the numbers 3, 9, 27, 81, 243 is :

A. $3\sqrt{3}$

B. 81

C. 27

D. 9

Answer: C

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41. The harmonic mean of 3, 7, 8, 10, 14 is :

A. $\dfrac{1}{5}(3 + 7 + 8 + 10 + 14)$

B. $\dfrac{1}{4}\left(\dfrac{1}{3} + \dfrac{1}{7} + \dfrac{1}{8} + \dfrac{1}{10} + \dfrac{1}{14}\right)$

C. $\dfrac{5}{\frac{1}{3} + \frac{1}{7} + \frac{1}{8} + \frac{1}{10} + \frac{1}{14}}$

D. None of these

Answer: C

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42. For a frequency distribution, 7th decile is computed by the formula :

A. $D_7 = l + \dfrac{\left(\frac{10N}{7} - c\right)}{f} \times i$

B. $D_7 = l + \dfrac{\left(\frac{7N}{10 - c}\right)}{f} \times i$

C. $D_7 = l + \dfrac{\left(\frac{N}{10} - c\right)}{f} \times i$

D. None of these

Answer: B

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43. For a frequency distribution, lower quartile is :

A. $Q_1 = l + \dfrac{\left(\frac{3N}{4} - c\right)}{f} \times i$

B. $Q_1 = l + \dfrac{\left(\frac{N}{4} - c\right)}{f} \times i$

C. $Q_1 = l + \dfrac{\left(\frac{N}{2} - c\right)}{f} \times i$

D. None of these

Answer: B

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44. The variance of the first n natural numbers is :

A. $\dfrac{n^2 + 1}{12}$

B. $\dfrac{n^2 - 1}{12}$

C. $\dfrac{n^2 - 1}{6}$

D. None of these

Answer: B

45. For a frequency distribution, standard deviation is computed by applying the formula :

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

B. $\sqrt{\dfrac{\sum fd}{\sum f^2} - \dfrac{\sum fd^2}{\sum f}}$

C. $\sqrt{\dfrac{\sum fd^2}{\sum f} - \dfrac{\sum fd}{\sum f}}$

D. None of these

Answer: A

46. For a frequency distribution, standard deviation is computed by :

A. $\sigma = \sqrt{\dfrac{\sum f(X - \overline{X})}{\sum f}}$

B. $\sigma = \sqrt{\dfrac{\sum f(X - \overline{X})^2}{\sum f}}$

C. $\sigma = \sqrt{\dfrac{\sum f(X - \overline{X})^2}{\sum f}}$

D. None of these

Answer: A

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47. In an arranged discrete series in which total number of observations n is even, median is :

A. Mean of $\dfrac{n}{2}$ th and $\left(\dfrac{n}{2} + 1\right)$ th item

B. $\left(\dfrac{n}{2} + 1\right)$ th item

C. $\dfrac{n}{2}$ th item

D. None of these

Answer: A

48. The average of n numbers $x_1, x_2, \ldots, x_n$ is M. If x_n is replaced by x', then new average is :

A. $\dfrac{x M - x_n + x'}{n}$

B. $\dfrac{(n-1)M + x'}{n}$

C. $\dfrac{M - x_n + x'}{n}$

D. None of these

Answer: A

49. Which of the following, in case of a discrete data, is not equal to the median :

A. Lower quartile

B. 2nd quartile

C. 5th decile

D. 50 th percentile

Answer: A

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50. If $\overline{X}$ is arithmetic mean of $x_1, x_2, \ldots x_n$ and $a \neq \overline{X}$ is any number, then :

A. $\displaystyle\sum_{i=1}^{n} (x_i - \overline{X})^2 > \sum_{i=1}^{n} (x_i - a)^2$

B. $\sum_{i=1}^{n} (x_i - \overline{X})^2 = \sum_{i=1}^{n} (x_i - a)^2$

C. $\sum_{i=1}^{n} (x_i - \overline{X})^2 < \sum_{i=1}^{n} (x_i - a)^2$

D. Either relation can be true depending upon the value of a

Answer: D

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51. For a bivariate distribution (X, Y), if

$\sum x = 50, \sum y = 60, \sum xy = 350, \overline{X} = 5, \overline{Y} = 6,$ Variance

of x is 4, variance of y is 9, then r_{xy} equals :

A. $\dfrac{5}{6}$

B. $\dfrac{5}{36}$

C. $\dfrac{11}{3}$

D. $\dfrac{11}{18}$

Answer: A

52. If the coefficient of correlation between x and y is 0.28, co-variance between x and y is 7.6 and the variance of x is 9, then the S.D. of y series is :

A. 9.8

B. 10.1

C. 9.05

D. 10.05

Answer: C

53. The A.M. of n observations is M. If the sum of n - 4 observations is a, then the mean of remaining 4 observations is :

A. $\dfrac{nM - a}{4}$

B. $\dfrac{nM + a}{4}$

C. $\dfrac{nM - a}{2}$

D. n M + a

Answer: A

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54. 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 number of the girls ?

A. 73

B. 65

C. 68

D. 74

Answer: B

55. Consider the following statements :

(a) Mode can be computed from histogram

(b) Median is not independent of change of scale

(c) Variance is independent of change of origin and scale.

Which of these is/are correct ?

A. only (a)

B. only (b)

C. only (a) and (b)

D. (a), (b) and (c)

Answer: B

56. In a series of 2n observations, half of them equal to a and remaining equal to b. If the standard deviation of the observations is 2, then |a| equals :

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

B. $\sqrt{2}$

C. 2

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

Answer: B

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

A. 20.5

B. 22.0

C. 24.0

D. 25.5

Answer: C

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58. If the mean deviation of the numbers : 1, 1 + d, 1 + 2d, ..., 1 + 100d from their mean is 255, then d is equal to :

A. 10.0

B. 20.0

C. 10.1

D. 20.2

Answer: C

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Multiple Choice Questions Level Ii

1. If a variable takes the discrete values :

$$\alpha + 4, \alpha - \frac{7}{2}, \alpha - \frac{5}{2}, \alpha - 3, \alpha - 2, \alpha + \frac{1}{2}, \alpha - \frac{1}{2}, \alpha + 5, (\alpha > 0)$$

, then the median is :

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

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

C. $\alpha - 2$

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

Answer: A

2. The mean of the values of 0, 1, 2, ..., n, having corresponding weight $.^n C_0, .^n C_1, .^n C_2, ... , .^n C_n$ respectively is :

A. $\dfrac{2^n}{n+1}$

B. $\dfrac{2^{n+1}}{n(n+1)}$

C. $\dfrac{n+1}{2}$

D. $\dfrac{n}{2}$

Answer: D

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

A. $\dfrac{19.76}{35.16} \times 10$

B. $\dfrac{35.16}{19.76} \times 100$

C. $\dfrac{19.76}{35.16}$

D. None of these

Answer: B

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4. 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. 80

B. 50

C. $82\dfrac{1}{2}$

D. 48

Answer: B

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5. The A.M. of a set of 50 numbers is 38. If two numbers of the set namely 55 and 45 are discarded, the A.M. of the remaining set of numbers is :

A. 36

B. 37.5

C. 36.5

D. 38.5

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6. The mean income of a group of workers is $\bar{x}$ and that of another group is $\bar{y}$. If the number of workers in the second group is 10 times the number of workers in the first group, then the mean income of the combined group is :

A. $\dfrac{\bar{x} + 10\bar{y}}{5}$

B. $\dfrac{\bar{x} + 10\bar{y}}{11}$

C. $\dfrac{10\bar{x} + \bar{y}}{11}$

D. $\dfrac{\bar{x} + 10\bar{y}}{9}$

Answer: B

7. The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observations of the set is increased by 2, then the median of the new set :

    A. is decreased by 2

    B. is two times the original median

    C. remains the same as that of the original set

    D. is increased by 2.

Answer: C

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

   A. 80.33

   B. 78.00

   C. 188.66

   D. 177.33

Answer: A

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9. Let $x_1, x_2, \ldots\ldots, x_n$ be n observations such that $\sum x_i^2 = 400$ and $\sum x_i = 80$. Then a possible value of n among

the following is :

A. 18

B. 15

C. 12

D. 9

Answer: A

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10. 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 V_A / V_B is :

A. 1

B. $9/4$

C. $4/9$

D. $2/3$

Answer: A

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11. An automobile driver travels from plane to a hill station, a distance of 120 km at an average speed of 30 km per hour. He then makes the return trp at an average speed of 25 km per hour. He covers another 120 km distance on plane at an average speed of 50 km per hour. His average speed over the entire distance of 360 km will be :

A. $\dfrac{3}{\frac{1}{30} + \frac{1}{25} + \frac{1}{50}}$ km/hr

B. $\dfrac{30 + 25 + 50}{3}$ km/hr

C. $(30.25.50)^{1/3}$ km/hr

D. None of these

Answer: A

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12. 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. 20

B. 80

C. 60

D. 40

Answer: B

13. 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 = 3, b = 4

B. a = 0, b = 7

C. a = 5, b = 2

D. a = 1, b = 6

Answer: A

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1. 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 :

A. $\dfrac{5}{2}$

B. $\dfrac{11}{2}$

C. 6

D. $\dfrac{13}{2}$

Answer: B

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2. If the mean deviation about the median of the numbers :

a, 2a, ... , 50a is 50, then |a| equals :

A. 2

B. 3

C. 4

D. 5

Answer: C

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3. A scientist is weighing each of 30 fishes. Their mean weight

worked out is 30 gm and a standard deviation of 2 gm. Later, it was

found that the measuring scale was misaligned and always under

reported every fish weight by 2 gm. The correct mean and standard

deviation (in gm) of fishes are respectively :

A. 32, 2

B. 32, 4

C. 38, 2

D. 28, 4

Answer: A

4. 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 ?

A. median

B. mode

C. variance

D. mean

Answer: C

5. The variance of first 50 even natural numbers is :

A. 833

B. 437

C. $\dfrac{437}{4}$

D. $\dfrac{833}{4}$

Answer: A

6. The mean of the data set comparising of 16 observations is 16. If one of the observations 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 :

A. 16.8

B. 16.0

C. 15.8

D. 14.0

Answer: D

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Question From Karnataka Cet Comed

1. If the coefficient of variation and standard deviation are 60 and 21 respectively, the arithmetic mean of distribution is

A. 30

B. 21

C. 60

D. 35

Answer: D

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2. Find the mean for the following data

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

A. $8, \sqrt{26.25}$

B. $9, \sqrt{9, 25}$

C. 8,26.25

D. 9, 9.25

Answer: D

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3. The mean devision from the data 3,10,10,4 ,7,10,5 is

A. 3

B. 2

C. 3.75

D. 2.57

Answer: D

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