MATHS

BOOKS - MCGROW HILL EDUCATION MATHS (HINGLISH)

STATISTICS

Examples Concept Based Singel Correct Answer Type Questions

1. The mean deviation of an unground data is 50. If each observation is increased by 2% then the new mean deviation is

A. 50

B. 21

C. 49

D. 50.5

Answer: D

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2. In a nuclear endineering class there are 22 juniors 18 seniors and 10 greaduate student . If the juniors averaged 71 in the midterm examination the senior averaged 78 and the graduate students averaged 89 , the mean of the centre class is approximately.

A. 77

B. 80

C. 74

D. 81

Answer: A

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3. The mean marks got by 300 students in the subject of statistics was 45. The mean of the top 100 of them was found to be 70 and the mean of the

last 100 was known to be 20, then the mean of the remaining 100 students is

A. 40

B. 50

C. 45

D. 43

Answer: C

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4. The mean of variable 1,2..... N whose corresponding frequencies are 1,2..... N is given by

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

B. $\frac{2n+1}{6}$

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

D. $\frac{2n+1}{3}$

Answer: D

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

A. 4 and 9

B. 3 and 5

C. 2 and 6

D. 4 and 6

Answer: A

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6. In a set of 20 observation , each of the observation below the median of all observation is increased by 6 and each of the remaining observation is decreased by 2. Then the mean of the new set of observations.

A. increase by 1

B. decrease by 1

C. increase by 4

D. increase by 2

Answer: D

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7. If the mean of a set of observation $x_1, x_2, \ldots\ldots x_{10}$ is 20 then the mean of $x_1 + 4, x_2 + 8, x_3 + 12, \ldots\ldots\ldots\ldots x_{10} + 40$ is

A. 34

B. 42

C. 38

D. 40

Answer: B

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Examples Level 1 Singel Correct Answer Type Questions

1. Let G_1, G_2 be the geometric means of two series $x_1, x_2, \ldots, x_n; y_1, y_2, \ldots, y_n$.If G is the geometric mean of $\frac{x_i}{y_i}$, i = 1,2,... n, then G is equal to

A. $G_1 - G_2$

B. $\log G_1 / \log G_2$

C. $\log (G_1 / G_2)$

D. none of these

Answer: D

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2. The monthly sales for the first 11 months of the year of a certain salesman were Rs. 12,000 but due to his illness during the last month the average sales for the whole year came down to Rs 11,375 . The value of the sale during the last month was

A. Rs 4,500

B. Rs 6,000

C. Rs 10,000

D. Rs 8,000

Answer: A

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3. The A.M of the observations $1.3.5, 3.5.7, 5.7.9, \ldots, (2n-1)(2n+1)(2n+3)$ is

A. $2n^3 + 6n^2 + 7n - 2$

B. $n^3 + 8n^2 + 7n - 2$

C. $2n^3 + 5n^2 + 6n - 1$

D. $2n^3 + 8n^2 + 7n - 2$

Answer: D

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4. If $x_1, x_2, \ldots\ldots\ldots x_{18}$ are observation such that $\sum_{j=1}^{18}(x_j - 8) = 9$ and $\sum_{j=1}^{18}(x_j - 8)^2 = 45$, then the standard deviation of these observations is

A. $4/9$

B. $9/4$

C. $3/2$

D. none of these

Answer: C

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5. A variable takes the values of $0,1,2,.....,n$ with frequencies proportional to the binomial coefficients $C_0,C_1,C_2,.....,C_n$, then mean of the distribution is

(1) $\frac{n(n+1)}{4}$ (2) $\frac{n}{2}$ (3) $\frac{n(n-1)}{2}$ (4) $\frac{n(n+1)}{2}$

A. $\frac{n(n+1)}{4}$

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

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

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

Answer: B

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6. The mean of two samples of sizes $200 \text{ and } 300$ were found to be $25, 10$ respectively. Their standard deviations were $3 \text{ and } 4$ respectively.The variance of combined sample of size 500 is

A. 64

B. $65:2$

C. 67.2

D. 64.2

Answer: C

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7. The variance of first 20- natural numbers is

A. $133/4$

B. $379/12$

C. $133/2$

D. $399/4$

Answer: A

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8. If the standard deviation of $x_1, x_2, \ldots\ldots x_n$ is 3.5, then the standard deviation of $-2x_1, -3, -2x_2, -3, \ldots\ldots, -2x_n - 3$is

A. -7

B. -4

C. 7

D. 1.75

Answer: A

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9. The geometric mean of $3, 3^2, \ldots, 3^n$ is

A. $3^{n/2}$

B. $3^{(n+1)/2}$

C. $3^{n(n+1)/2}$

D. none of these

Answer: B

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10. If the median of 21 observations is 40 and if the observations greater than the median are increased by 6 then the median of the new data will be

A. 40

B. 46

C. $46 + 40/21$

D. $46 - 40/21$

Answer: A

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11. The median from the following data

Wages/week (Rs.)	*No. of workers*	*Wages/week*	*No. of workers*
50-59	15	90–99	45
60-69	40	100–109	40
70-79	50	110–119	15
80-89	60		

A. 83.17

B. 84.08

C. 82.17

D. 85.67

Answer: B

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12. If the standard deviation of numbers 2,4 5 and 6 is a constant α then the standard deviation of the number 4,6, 7 and 8 is

A. $\alpha + 2$

B. 2α

C. α

D. $\sqrt{2\alpha}$

Answer: C

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13. The variance of α, β and γ is 9, then variance of $5\alpha, 5\beta, 5\gamma$ is

A. 45

B. $5/9$

C. $9/5$

D. 225

Answer: D

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14. $1, 2, 4, 6, 8, 9$ transformed into another series whose mean is 12. Two middle terms of the transformed series are

A. $7, 8$

B. $10, 14$

C. $9, 15$

D. $11, 13$

Answer: D

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15. A variable takes the values of $0,1,2,.....,n$ with frequencies proportional to the binomial coefficients $C_0,C_1,C_2,.....,C_n$, then mean of the distribution is

(1) $\frac{n(n+1)}{4}$ (2) $\frac{n}{2}$ (3) $\frac{n(n-1)}{2}$ (4) $\frac{n(n+1)}{2}$

A. n

B. $\sqrt{n}/2$

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

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

Answer: D

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16. If the mean deviation of the numbers $1, 1+d, 1+2d, \ldots, 1+100d$ from their mean is 255, then the d is equal to (1) 10.0 (2) 20.0 (3) 10.1 (4) 20.2

A. 10.1

B. 20.2

C. 10.0

D. 20.0

Answer: A

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17. 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. 6

B. $13/2$

C. $5/2$

D. $11/2$

Answer: D

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18. If the mean deviation about the median of the numbers a, 2a, ..., 50a is 50, then |a| equals : (1) 2 (2) 3 (3) 4 (4) 5

A. 5

B. 2

C. 3

D. 4

Answer: D

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19. 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 20.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) $28, 4$ (b) $32, 2$ (c) $32, 4$ (d) $28, 2$

A. $32, 2$

B. $32, 4$

C. $28, 2$

D. $28, 4$

Answer: A

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Examples Level 2 Singel Correct Answer Type Questions

1. Given the following frequency distribution with some missing frequencies

$(Class, \text{Frequency}), (10-20, , 180), (20-30, , \ - \ -), (30-40, , 34), (40$

If the total frequency is 685 and median is 42.6 then the missing frequencies are

A. $81, 24$

B. $80, 25$

C. $82, 23$

D. $832, 22$

Answer: C

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2. Find the mean deviation from the mean of the A.P., a,a+d, a+2d, ...,a+2nd.

A. $\frac{n(n+1)d^2}{3}$

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

C. $a + \frac{n(n+1)d^2}{2}$

D. none of these

Answer: D

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3. Sum of absolute deviations about median is

A. least

B. greatest

C. zero

D. equal to median

Answer: A

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4. In any discrete series (when all the valuenot same) the relationship betweemean and S.D. is

A. $M.D. = S.D.$

B. $M.D. > S.D.$

C. $M.D. > S.D.$

D. $M.D. \leq S.D.$

Answer: C

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5. The median and standard deviation (S.D.) ofa distribution will be, If each term is increased by 2 median and S.D. will increased by 2 (1) mediam and S.D. will increased by 2 (2) `median will increased by 2 but S.D. will remain same (3) median will remain same but S.D. will increased by 2 (4) median and S.D. will remain same

A. median will increase and S.D. will also increase

B. median will will go up by 2 but S.D. will remain same

C. median will incease but S.D. will decrease

D. none of these

Answer: B

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6. If the arithmetic mean of first n natural numbers is $\frac{38}{75}n,$ then n is equal to _____

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Examples Numerical Answer Type Questions

1. In a data the number i is repeated i times for i=1, 2,..., n. Then the mean of the data is

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2. The median of a set of 13 distinct observation is 187. 3. If each of the five larger observation is increased by 12.5 and each of the five smaller

observations are decreased by 7.5 then the median of the new set of obervation is _____

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3. If two ogives intersect at (21, 52) then number of observations in the data is _____

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4. The median of 100 observation grouped in classes of equal width is 55 if the median class is 50-60 and the number of observation less than 50 is 45, then frequency of the median class is _____

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5. If the mean deviation of the number $a, a+d, a+2d, \ldots\ldots, a+200d$ from their mean is $\frac{2525}{201}$ then |d| is

equal to :

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6. If the median and the range of four numbers $a, b, 2a+b, a-b$ where $0 < b < a < 2b$, are 15 and 42, the standard deviation of a and b , is

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7. In an examination there are 30 multiple choice questions. For each correct answer a student gets 4 marks and for each incorrect answer the student gets zero marks. If a students attempts all the questions , then maximum possible standard deviation of the marks scored by the students is _____

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8. Suppose mean of the observations

$4, 7, a, b, 10, 12, 13$

is 9 and mean deviation from mean is $16/7$. If a and b are integers , then

$|b - a|$ is equal to

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Exercise Concept Based Single Correct Answer Type Questions

1. The mean of 5 observations is 3 and variance is 2. If three of the five observations are 1,3,5 the other two are

A. $2, 6$

B. $3, 3$

C. $1, 5$

D. 2.4

Answer: D

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2. 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

A. standard deviations increases

B. standard deviations decreases

C. Standard deviations will remain same

D. mean increases by 4%

Answer: B

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3. the mean weight of 150students in a certain class is $60kg$. The mean of boys in the class is $70kg$ and that of girls is $55kg$. The number of boys

and the number of girls in the class, are respectively

A. $\frac{700}{3}$

B. $\frac{500}{3}$

C. $\frac{400}{7}$

D. $\frac{300}{7}$

Answer: A

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4. If $n = 10, X = 12 and \sum x12 = 1530,$ then the coefficient of variation is 36% (b) 41% (c) 25% (d) none of these

A. 16

B. 9

C. 25

D. 36

Answer: C

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5. The first of the two samples have 100 items with mean 15 and S.D.3. If the whole group has 250 items with mean 15.6 and $S.D. = \sqrt{13.44}$ then S.D. of the second group is

A. 3

B. 2

C. 4

D. 5

Answer: C

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6. If the variables with values $10, 20, 30, 40$ have frequencies $x, x+2, x-2, x+4$ and the mean is 2. 7 then the value of x is

A. 2

B. 4

C. 6

D. 5

Answer: D

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Exercise Level 1 Single Correct Answer Type Questions

1. प्रथम n प्राकृत संख्याओं का माध्य -

A. $(n+1)/2$

B. $(n-1)/2$

C. $n/2$

D. none of these

Answer: A

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2. The arithmetic mean of first n odd natural numbers, is

A. n

B. $(n+1)/2$

C. $(n-1)$

D. none of these

Answer: A

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3. The arithmetic mean of the squares of the first n natural numbers is

A. $(n+1)/6$

B. $(n+1)(2n+1)/6$

C. $\left(n^2-1\right)/6$

D. none of these

Answer: B

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4. The arithmetic mean of the series $1, 2, 2^2, \ldots\ldots 2^{n-1}$ is

A. $2^n/n$

B. $(2^n-1)/n$

C. $\left(2^{n+1}\right)/n$

D. none of these

Answer: B

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5. The arithmetic mean of the series ${}^nC_0, {}^nC_1, {}^nC_2 \ldots, {}^nC_n$ is

A. $2^n/(n+1)$

B. $2n/n$

C. $2^{n-1}/(n+1)$

D. none of these

Answer: A

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6. The mean of the series a, a + d, a + 2d, ..., a + 2 nd, is

A. $a + (n-1)d$

B. $a+(n+1)d$

C. $a+(n+2)d$

D. none of these

Answer: D

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7.

Variate (x)	0	1	2	3	...	n
Frequency (f)	${}^nC_0$	${}^nC_1$	${}^nC_2$	${}^nC_3$	....	${}^nC_n$

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

B. $\sqrt{n/2}$

C. $2^n/n$

D. none of these

Answer: D

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8. The mean height of 25 (male workers in a factory is 161 cms and the mean height of 35 female workers in the same factory is 158 cms. The combined mean height of 60 workers in the factory is

A. 159.25

B. 159.5

C. 159.75

D. 158.75

Answer: A

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9. The average salary of male employees in a firm was Rs. 5200 and that of females was 4200. The mean salary of all the employees was Rs 5000 . The percentage of male employees is

A. 80

B. 60

C. 40

D. 20

Answer: A

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10. The mean weight of 9 items is 15. If one more item is added to the series the mean becomes 16. The value of 10th item is (a) 35 (b) 30 (c) 25 (d) 20

A. 35

B. 30

C. 25

D. 20

Answer: C

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11. For a certain frequency table which has been partly reproduced here , the arithmetic mean was found to be Rs. 28.07

Income (in Rs)	15	20	25	30	35	40
No. of workers:	8	12	?	16	?	10

If the total number of workers is 75, then the missing frequencies are

A. $14, 15$

B. $15, 14$

C. $13, 16$

D. $12, 17$

Answer: B

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12. The value of median for the data

Income

(in Rs.)

1000	1100	1200	1300	1400	1500
No. of persons :					
14	26	21	18	28	15 is

A. 1300

B. 1200

C. 1250

D. 1150

Answer: B

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13. The median from the following date :

Mid-value	Frequency	Mid-value	Frequency
115	6	165	60
125	25	175	38
135	48	185	22
145	72	195	3
155	116		

is

A. 153. 79

B. 153. 91

C. 165. 18

D. 165. 93

Answer: A

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14. In a discrete series , the relation between s.d.s and range r is

A. $s \geq r$

B. $s > r$

C. $r = s$

D. $s \leq r$

Answer: D

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15. if A.M.,G.M. and H.M. in series are equal then

A. the distribution is symmetric

B. all the values are same

C. the distribution is uninormal

D. none of these

Answer: B

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16. For a group containing 100 observations, the arithmetic mean and standard deviation are 8 and $\sqrt{10.5}$. For 50 observations selected from the 100 observations, the arithmetic mean and standard deviations are 10 and 2 respectively. Find the arithmetic mean and the standard deviation of the other half.

A. 2

B. 3

C. `(##MGH_50Y_JEE_MN_MAT_C23_E01_022_O03.png" width="30%">

D. (4)

Answer: B

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17. A sample of 90 values has mean 55 and standard deviation 3. A second sample of 110 values has mean 60 and standard deviations 2. The combined variance is equal to (upto two decimal)

A. 12.43

B. 11.24

C. 10.43

D. 13.25

Answer: A

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Exercise Level 2 Single Correct Answer Type Questions

1. If standard deviation of a set of observation is 4 and if each of the observations is divided by 4, then the standard deviation of new set of observations is

A. 4

B. 3

C. 2

D. 1

Answer: D

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2. 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 -4 (b) -8 (c) 8 (d) 4

A. -4

B. -8

C. 8

D. 4

Answer: D

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3. The mean square deviations of a set of observations $x_1, x_2, \ldots, x_n$ about a point c is defined to be $\frac{1}{n}\sum_{i=1}^{n}(x_i - c)^2$. The mean square deviations about -1 and +1 of a set of observations are 7 and 3, repectively. Find the standard deviation of this set of observations.

A. 3

B. 2

C. 1

D. none of these

Answer: A

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4. If the S.D. of n observations $x_1, x_2, x_3 \ldots\ldots x_n$ is 4.and another set of n observations $y_1, y_2. y_3 \ldots\ldots y_n$,is 3 the S.D. of n observations $x_1 - y_1, x_2 - y_2, x_3 - y_3 \ldots\ldots\ldots\ldots\ldots\ldots x_n - y_n$ is

A. 1

B. $2\sqrt{3}$

C. 5

D. none of these

Answer: D

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5. If the variable takes values $0, 1, 2, \ldots, n$ with frequencies $q^n, {}^nC_1 q^{n-1} p, {}^nC_2 q^{n-2} p^2, \ldots {}^nC_n p^n$, where $p + q = 1$, then the mean is

A. np

B. nq

C. npq

D. np^2

Answer: A

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6. If a variable takes values $0, 1, 2, 3, \ldots\ldots$ with frequencies proportional to $e^{-\lambda}, e^{-\lambda}\lambda, \frac{e^{-\lambda}\lambda^2}{2!}, \frac{e^{-\lambda}\lambda^3}{3!}, \ldots.$ then the mean of the distribution is

A. $e^{-\lambda}$

B. λ

C. $e^{-\lambda}\lambda$

D. $\left(\frac{1}{2}\right)e^{-\lambda}\lambda^2$

Answer: B

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7. The standard deviation is not affected by the change of

A. origin

B. scale

C. origin and scale

D. none of these

Answer: A

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8. If x_1, x_2, x_3 are three non-zero real numbers such that $\left(x_1^2 + x_2^2\right)\left(x_2^2 + x_3^2\right) \leq \left(x_1 x_2 + x_2 x_3\right)^2$ then the G.M. Of x_1, x_2, x_3 is

A. x_1

B. x_2

C. x_3

D. $\frac{x_1 x_2 x_3}{3}$

Answer: B

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9. The mean and s.d. of a sample of size 10 were found to be 9.5 and 2.5 respectively . Later on , an additional observation 15 was added to the original data. The s.d. of 11 observation is

A. 2.6

B. 2.8

C. 2.86

D. 3.24

Answer: C

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10. For a group of 50 male workers, the mean and the standard deviation of their daily wages are Rs. 630 and Rs. 90 respectively and for a group of

40 female workers these are Rs. 540, and Rs . 60 respectively. Then, the standard deviation of all these 90 workers is

A. 60

B. 70

C. 80

D. 90

Answer: D

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11. The mean marks of 120 students is 20. It was later discovered that two marks were wrongly taken as 50 and 80 instead of 15 and 18. The correct mean of marks

A. 19.19

B. 19.17

C. 19.21

D. 19.14

Answer: A

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12. Let q be the range and $S^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - x)^2$ be the S.D. of a set of observations $x_1, x_2, \ldots\ldots\ldots, x_n$. Then

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

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

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

D. none of these

Answer: B

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Exercise Numerical Answer Type Questions

1. Arithmetic mean of the series $2, -2, 2, -2, \ldots\ldots\ldots$, up to 100 times is _____

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2. If two ogives of a data intersect (37, 51) , the total number of observation in the data is _____

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3. Suppose a set of 50 observations : $251, 252, \ldots\ldots, 300$ has standard deviations σ_1 and another set of 50 observations : $401, 402, \ldots\ldots, 450$ has standard deviations σ_2, $\text{then} \frac{\sigma_1 - \sigma_2}{\sigma_1 + \sigma_2}$=_____

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4. Suppose $\sum_{k=1}^{10}(x_k-1)^2=125, \sum_{k=1}^{10}x_k=5$ then standard deviations of $x_1, x_2, \ldots\ldots, x_{10}$ is _____

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5. For n observations $x_1, x_2, \ldots\ldots, x_n \sum_{i=1}^{n}x_i^2=500$ and $\sum_{i=1}^{n}x_i=100,$ then least possible value of n= _____

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6. If standard deviations of the data 1,2,....., 2n +1 is $\sqrt{30}$ then n is equal to _____

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7. If harmonic mean of three numbers 2,4, and x is 3, then x is equal to _____

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8. Perkyowl Designs operates its factory in two shifts. There are 65 workers in Shifts I and have mean wages of rupes 525 per day whereas there are 35 workers in the Shifts II. If the combined wages of entire set of 100 workers is rupes 542, 50 then average wages (in rupes) of the workers in Shifts II, is _____

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9. Out of 30 observations 10 are equal to $70-2\alpha$ each, 10 are equal to 7 each and the remaining 10 are equal to $7+2\alpha$ each. If standard deviations of the data is equal to $5\sqrt{\frac{2}{3}}$ then $|\alpha|$ is equal to _____

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Question From Previous Years Aiee Jee Main Papers

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

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2. 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

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3. 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 (1) 8.33 (2) 78 (3) 188.66 (4) 177.33

A. 78

B. 188.66

C. 177.33

D. 833

Answer: A

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4. Consider the following statements:

(1) Mode can be computed from histrogram

(b) Median is not independent of change of scale

© Which of these is/are correct

A. only (1) and (3)

B. only (2)

C. only (1)

D. (1),(2),(3)

Answer: C

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5. In a series of $2n$ observations, half of them equal a end remaining half equal $-a$. If the S.D. of the observationsis 2, then $|a|$ equals (1) $\frac{1}{n}$ (2) $\sqrt{2}$ (3) 2 (4) $\frac{\sqrt{2}}{n}$

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

B. $\sqrt{2}$

C. 2

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

Answer: C

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6. Let $x_1, x_2, \ldots\ldots x_n,$ bem n observations such that $\sum x_i^2 = 400$ and $\sum x_i = 80$. Then a possible value of n amongthe following is (1) 12 (2) 9 (3) 18 (4) 15

A. 15

B. 18

C. 9

D. 12

Answer: B

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7. 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

A. 25.5

B. 24.0

C. 22.0

D. 20.5

Answer: B

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8. Suppose a population A has 100 observations $101, 102, \ldots\ldots\ldots\ldots, 200$ and another population B has 100 observations $151, 152, \ldots\ldots .250.$ If V_A and V_B represent the variances of the two populations respectively,then $\frac{V_A}{V_B}$ is (a) 1 (b) $\frac{9}{4}$ (c) $\frac{4}{9}$ (d) $\frac{2}{3}$

A. $2/3$

B. 1

C. $9/4$

D. $4/9$

Answer: B

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9. 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 (1) 40 (2) 20 (3) 80 (4) 60

A. 40

B. 20

C. 80

D. 60

Answer: B

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10. 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? (1) $a = 0, b = 7$ (2) $a = 5, b = 2$ (3) $a = 1, b = 6$ (4) $a = 3, b = 4$

A. $a = 0, b = 7$

B. $a = 5, b = 2$

C. $a = 1, b = 6$

D. $a = 3, b = 4$

Answer: D

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11. If the mean deviation of the numbers $1, 1 + d, 1 + 2d, \ldots, 1 + 100d$ from their mean is 255, then the d is equal to (1) 10.0 (2) 20.0 (3) 10.1 (4) 20.2

A. 10.1

B. 20.2

C. 10.0

D. 20.0

Answer: A

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12. 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. 6

B. $13/2$

C. $5/2$

D. $11/2$

Answer: D

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13. If the mean deviation about the median of the numbers a, 2a, ..., 50a is 50, then |a| equals : (1) 2 (2) 3 (3) 4 (4) 5

A. 5

B. 2

C. 3

D. 4

Answer: D

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14. 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 20.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) $28, 4$ (b) $32, 2$ (c) $32, 4$ (d) $28, 2$

A. $32, 2$

B. $32, 4$

C. $28, 2$

D. $28, 4$

Answer: A

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15. 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. mean

B. median

C. mode

D. variance

Answer: D

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16. If the median and the range of four numbers $\{x, y, 2x + y, x - y\}$, where $0 < y < x < 2y$ are 10 and 28 respectively,

then the mean of numbers is

A. 18

B. 10

C. 5

D. 14

Answer: D

View Text Solution

17. The mean of a data set consisting of 20 observations is 40. If on observations 53 was wrongly recorded as 33, then the correct mean will be

A. 41

B. 49

C. 40.5

D. 42.5

Answer: A

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18. 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

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19. In a set of 2n distinct observation, each of the observation below the median of all the observations is increased by 5 and each of the remaining observations is decreased by 3. Then the mean of the new set of observations:

A. increase by 1

B. decrease by 1

C. decrease by 2

D. increase by 2

Answer: A

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20. Let $\bar{x}$ and M.D. be the mean and the mean deviations about $\bar{x}$ of n observations $x_i, i = 2. \ldots . ., n$ If each of the observation is increased by 5, then the new mean and mean deviations about the new mean, respectively are:

A. $\bar{x}, M.D.$

B. $\bar{x}+5, M.D.$

C. $\bar{x}, M.D.+5$

D. $\bar{x}-15, M.D.+5$

Answer: B

View Text Solution

21. A factory is operating in two shifts, day and night with 70 and 30 workers respectively. If per day mean wage of the day shift workers is rupes 54 and per day mean wages of all the workers is rupes 60 , Then per day mean wages of the night shift (in Rs.) is :

A. 66

B. 69

C. 74

D. 75

Answer: C

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22. 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

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23. 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. $3a^2 - 26a + 55 = 0$

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

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

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

Answer: B

Watch Video Solution

24. If the mean deviation of the numbers $1, 1 + d, 1 + 2d, \ldots, 1 + 100d$ from their mean is 255, then the d is equal to (1) 10.0 (2) 20.0 (3) 10.1 (4) 20.2

A. 10.1

B. 5.05

C. 20.2

D. 10

Answer: A

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25. The mean of 5 observations is 5 and their variance is 124. If three of the observationsare $1, 2 \text{ and } 6,$ then the mean deviation from the mean of the data is (1) 2.4 (b) 2.8 (c) 2.5 (d) 2.6

A. 2.5

B. 2.6

C. 2.8

D. $(1.6) + \left(1 + 3\sqrt{2}\right)$ (modified)

Answer: D

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26. The mean age of 25 teanchers of a school is 40 years. A teacher retires at the age of 60 years and a new teachers is appointed in his place. If now the mean age of the teachers in the school is 39 years. Then the age of the newly appointed teacher is

A. 25

B. 30

C. 35

D. 40

Answer: C

View Text Solution

27. The sum of 100 observations and sum of their squares are 400 and 2,475 respectively . Later on three observatons 3,4 and 5 were found to be

incorrect.If the incorrect observations are omitted, then variance of the remaining observations is:

A. 8.25

B. 8.50

C. 8.00

D. 9.00

Answer: D

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28. If $\sum_{i=1}^{9}(x_i - 5) = 9$ and $\sum_{i=1}^{9}(x_i - 5)^2 = 45$ then the standard deviation of the 9 items $x_1, x_2, \ldots\ldots, x_9$ is

A. 4

B. 2

C. 3

D. 9

Answer: B

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29. The mean of a set of 30 observations is 75. If each observations is multiplied by a non-zero numberseλ and then each observations is decreased by 25, their mean remains the same. Then λ is equal to

A. $\frac{1}{3}$

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

C. $\frac{4}{3}$

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

Answer: C

View Text Solution

30. If the mean of the data $7, 8, 9, 7, \lambda, 8,$ is 8 then variance of the data is:

A. 2

B. 1

C. $\frac{7}{8}$

D. $\frac{9}{8}$

Answer: B

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31. The mean and standard deviations (s.d.) of five observations are 9 and 0 respectively. If one observations is changed such that mean of the new set of five observations becomes 10, then their s.d. is

A. 0

B. 1

C. 2

D. 4

Answer: C

View Text Solution

32. Average height & variance of 5 students in a class is 150 and 18 respectively. A new student whose height is $156cm$ is added to the group. Find new variance. (a) 20 (b) 22 (c) 16 (d) 14

A. 22

B. 20

C. 16

D. 18

Answer: B

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33. A data consists of n observations: $x_1, x_2, \ldots\ldots x_n$, If $\sum_{i=1}^{n}(x_1+1)^2 = 9n$ and $\sum_{i=1}^{n}(x_1-1)^2 = 5n$, then the standard deviations of this data is:

A. 5

B. $\sqrt{5}$

C. $\sqrt{7}$

D. 2

Answer: B

View Text Solution

34. The mean of five observations is 5 and their variance is 9.20. If three of the given five observations are 1,3 and 8, then a ratio of other two observations is

A. $4:9$

B. $6:7$

C. $5:8$

D. $10:3$

Answer: A

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35. If mean and standard deviation of 5 observations x_1, x_2, x_3, x_4 are 10 and 3 respectively , then the variance of 6 observation $x_1, x_2, \ldots . x_5$ and -50 is equal to:

A. 582.5

B. 507.5

C. 586.5

D. 509.5

Answer: B

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36. The outcome of each of 30 items was observed , 10 items gave an outcome $\frac{1}{2} - d$ each, 10 items gave outcome $\frac{1}{2}$ each and the remaining 10 items gave outcome $\frac{1}{2} + d$ each. If the variance of this outcome data is $\frac{4}{3}$, then |d| equals

A. 2

B. $\sqrt{2}$

C. $\frac{\sqrt{5}}{2}$

D. $\frac{2}{3}$

Answer: B

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37. If the sum of the deviations of 50 observations from 30 is 50, then the mean of these observations is

A. 50

B. 51

C. 30

D. 31

Answer: D

Watch Video Solution

38. Mean and variance of five observations are 4 and 5.2 respectively. If three of these observations are $3, 4, 4$ then find absolute difference between the other two observations (A) 3 (B) 7 (C) 2 (D) 5

A. 1

B. 2

C. 7

D. 5

Answer: C

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39. 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.

A. 48

B. 45

C. 40

D. 49

Answer: A

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40. A student scores the following marks in five tests 45, 54, 41, 57, 43. His score is not known for the sixth test. If the mean score is 48 in the six tests, then the standard deviation of the marks in six tests is

A. $\frac{10}{\sqrt{13}}$

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

C. $\frac{100}{\sqrt{3}}$

D. $\frac{100}{3}$

Answer: A

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41. If the standard deviation of the numbers $-1, 0, 1, k$ is $\sqrt{5}$ where $k > 0$, then k is equal to $2\sqrt{l}$. The value of l is _____.

A. $2\sqrt{\frac{10}{3}}$

B. $4\sqrt{\frac{5}{3}}$

C. $2\sqrt{6}$

D. $\sqrt{6}$

Answer: C

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42. The mean and the median of the following ten numbers in increasing order 10, 22, 26, 29, 34, x, 42, 67, 70, y are 42 and 35 respectively, then $\frac{y}{x}$ is equal to

A. $7/2$

B. $7/3$

C. $9/8$

D. $8/3$

Answer: B

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43. If for somes $x \in R$ the frequency distribution of marks obtained by 20 students in a test is:

Marks	2	3	5	7
Number of students	$(x+1)^2$	$2x-5$	x^2-3x	x

Then the mean of the marks is:

A. 2.5

B. 3.0

C. 2.8

D. 3.2

Answer: C

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44. If both the mean and the standard deviation of 50 observatios $x_1, x_2, \ldots . x_{50}$ are equal to 16, then the mean of $(x_1 - 4)^2, (x_2 - 4)^2, \ldots . , (x_{50} - 4)^2$ is

A. 380

B. 525

C. 400

D. 480

Answer: C

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45. If the data $x_1, x_2, \ldots . x_{10}$ is such that the mean of four of these is 11, the mean of the remainning six is 16 and sum of squares of all these is 2000, then the standard deviations of this data is:

A. 2

B. $2\sqrt{2}$

C. 4

D. $\sqrt{2}$

Answer: A

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Question From Previous Years B Architecture Entrance Examination Papers

1. The mean deviation of an ungrouped data is 10. If each observation is increased by 4% the revised mean deviations is

A. 10.0

B. 10.4

C. 10.04

D. 9.6

Answer: A

View Text Solution

2. There are 30 boys and 20 girls in a class. The mean and variance of their marks in maths are, respectively, 65 and 100. If 5 grace marks are added to the score of each students, then the revised mean and variance will be respectively.

A. $70, 100$

B. $70, \text{variance} > 100$

C. $65, \text{variance} < 100$

D. $65, 100$

Answer: A

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3. The mean and the median of 100 observation have been computed to be 60 and 70 respectively. Later it was discovred that three observations which have been recorded 18,28 and 98 are actually 80,26 and 38 respectively. If the mean and median are recalculated with equal observations, then

A. median will change but mean will not change

B. neither mean nor median will change

C. both mean and median will change

D. mean will change but median will not change

Answer: A

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4. Let a distribution be made by combining three distribution each having mean zero standard deviations, each having mean zero, standard

deviations 3,4 and 5 respectively. Then the variance of the combined distribution is equal to

A. $\frac{266}{15}$

B. 17

C. $\frac{50}{3}$

D. $\frac{62}{15}$

Answer: A

View Text Solution

5. In a class of 20 students , each can score either 10 or 0 marks in a certain examination. The maximum possible variance in the marks of the students in the class is

A. 24

B. 22

C. 20

D. 25

Answer: D

View Text Solution

6. If the mean and standard deviation of 20 observations $x_1, x_2 \ldots \ldots x_{20}$ are 50 and 10 respectively , then $\sum_{i=1}^{10} x_i^2$ is equal to

A. 2510

B. 50200

C. 52000

D. 2600

Answer: C

View Text Solution

7. If the mean of a set of observations $x_1, x_2, \ldots\ldots\ldots . , x_{10}$ is 20, then the mean of $x_1 + 4, x_2 + 8, x_3 + 12, \ldots\ldots . , x_{10} + 40$

A. 34

B. 42

C. 38

D. 40

Answer: B

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8. Suppose a population A has 100 observations $101, 102, \ldots\ldots\ldots\ldots , 200$ and another population B has 100 observations $151, 152, \ldots\ldots . 250.$ If V_A and V_B represent the variances of the two populations respectively,then $\frac{V_A}{V_B}$ is (a) 1 (b) $\frac{9}{4}$ (c) $\frac{4}{9}$ (d) $\frac{2}{3}$

A. $1:1$

B. $2:3$

C. $1:2$

D. $3:2$

Answer: A

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9. If the mean and standard deviation of 10 observations $x_1, x_2, \ldots\ldots, x_{10}$ are 2 and 3 respectively, then the mean of $(x_1+1)^2, (x_2+1)^2, \ldots\ldots, (x_{10}+1)^2$ is equal to

A. 13.5

B. 14.4

C. 16.0

D. 18.0

Answer: D

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10. Let $x_1, x_2 \ldots . x_{20}$ be 20 observations and $d_1 = 2(x_i - 5), I = 1, 2, \ldots \ldots 20.$ If the mean and variance of $d_1, d_2, \ldots \ldots , d_{20}$ are 20 and 12 respectively, then the mean and variance of $x_1, x_2, \ldots \ldots, x_{20}$ are respectively,

A. 10 and 3

B. 15 and 4

C. 15 and3

D. 10 and 4

Answer: C

View Text Solution

11. The mean deviatons about the median of the data set $4, 10, 6, 4, 13, 11, 19, m, 8, 7,$ where m ≥ 11 is an integer is 4, Then m is

equal to:

A. 14

B. 15

C. 16

D. 17

Answer: C

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12. If $x_1, x_2, \ldots\ldots, x_n$ be the observed data such that $\sum_{i=1}^{n} x_i - 2n = 180$ and $\sum_{i=1}^{n} x_i = 7n = 30$,then the mean of the data $(x_1 - 3), (x_2 - 3), \ldots. (x_n - 3)$ is equal to

A. 5

B. 8

C. $\frac{13}{3}$

D. $\frac{16}{3}$

Answer: A

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13. The mean deviation about the mean of data in the following frequency distribution:

` 

A. $\frac{4}{3}$

B. $\frac{13}{18}$

C. $\frac{5}{6}$

D. $\frac{5}{9}$

Answer: B

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