MATHS

BOOKS - OMEGA PUBLICATION

STATISTICS

Question

1. Find the mean deviation from the mean for following the data 4, 7, 8, 9, 10, 12, 13, 17.

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2. Find the mean deviation from the mean for the following data. 38, 70, 48, 40, 42, 55, 63, 46, 54, 44.

3. Find the mean deviation about the median for the data: 13, 17, 16, 14, 11, 13, 10, 16, 11, 18, 12, 17.

4. Find the mean deviation about the mean for the data:

x_i	5	10	15	20	25
f_i	7	4	6	3	5

5. Find the mean deviation about the median for the data:

x_i	15	21	27	30	35
f_i	3	5	6	7	8

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

Marks	0–10	10–20	20–30	30–40	40–50	50–60
No. of girls	6	8	14	16	4	2

7. Find the mean deviation about the mean for the data :

Income per- day	0–100	100–200	200–300	300–400	400–500	500–600	600–700	700–800
No. of person	4	8	9	10	7	5	4	3

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

9. Find the mean and variance for the following data: first n natural numbers.

10. Find the mean and variance for the data:

x_i	6	10	14	18	24	28	30
f_i	2	4	7	12	8	4	3

11. Find the mean, variance and standard deviation for the following frequency distribution:

Classes	0–10	10–20	20–30	30–40	40–50
Frequencies	5	8	15	16	6

12. Calculate the standard deviation and mean diameter of the circles (in mm) drawn in design are given below:

Diameter (in mm)	33–36	37–40	41–44	45–48	49–52
No. of circles	15	17	21	22	25

13. 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
Number of wage earners (worker)	586	648
Mean of monthly wages Rs	5253	5253
Variance of the distribution of wages	100	121

which firm A or B pays larger amount as monthly wages ?

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14. 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
Number of wage earners (worker)	586	648
Mean of monthly wages Rs	5253	5253
Variance of the distribution of wages	100	121

Which form A or B shows greater variability in individual wages ?

15. The following is 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 standard 1.25 goals. Find which team.may be considered more consistent ?

16. The sum and sum of squares corresponding to length x (in cm) and weight y (in 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 lengths or weight?

17. The mean and standard deviation of 6 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.

18. Given that $\bar{x}$ is the mean and σ^2 is the variance of n observations $x_1, x_2, x_3 \ldots x_n$ Prove that the mean and variance of the observations $ax_1, ax_2, ax_3 \ldots ax_n$ ax are $\bar{a}x$ and $a^2\sigma^2$, respectively, $(a \neq 0)$.

19. The mean and standard deviation of 20 observations are found to be 10 and 2 respectively. On

rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation if wrong item is omitted.

20. 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 were recorded as 21, 21 and 18. Find the mean and standard deviation if the incorrect observations were omitted.

21. Find the derivative of the following

sin3x + tanx

22. Find mean deviation about the medium for the data:

x_i	5	7	9	10	12	15
f_i	8	6	2	2	2	6

Multiple Choice Question

1. If the mean of the set of numbers $x_{,1}$, x_2, ...x_n is $\bar{x}$, then the mean of the numbers $x_i + 2i$, $1 \le i \le n$ is

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

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

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

D. $\bar{x} + n$.

Answer: B

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2. 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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3. Mean of 100 items is 49. It was discovered that three

items which should have been 60, 70, 80 were wrongly

read as 40, 20, 50 respectively. The correct mean is

A. 48

B. $82 \frac{1}{2}$

C. 50

D. 80

Answer: C

4. The number of observations 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. $\frac{1}{5}$

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

C. 4

D. 8

Answer: B

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5. A set of numbers consists of three 4's, five 5's, six 6's, 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

6. Which of the following is not a measure of central tendency?

A. Mean

B. Median

C. Mode

D. Range

Answer: D

7. Suppose values taken by a variable X are such that

$a \leq x_i \leq b$, where x_i denotes the value of X in the ith

case, for i=1,2,.... n then

A. $a \leq var(x) \leq b$

B. $a^2 \leq var(x) \leq b^2$

C. $\dfrac{a^2}{4} \leq var(X)$

D. $(b - a)^2 \geq var(X)$

Answer: D

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

A. $M - x_n + x'$

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

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

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

Answer: B

9. For a frequency distribution standard deviation is computed by applying the formula

A. $\sigma = \sqrt{\dfrac{\Sigma fd}{\Sigma f} - \dfrac{\Sigma fd^2}{\Sigma f}}$

B. $\sigma = \dfrac{\sqrt{\Sigma fd^2}}{\Sigma f} - \dfrac{\Sigma fd^2}{(\Sigma f)^2}$

C. $\sigma = \sqrt{\dfrac{\Sigma fd^2}{(\Sigma f)^2} - \dfrac{\Sigma fd^2}{\Sigma f}}$

D. $\sigma = \sqrt{\dfrac{\Sigma fd^2}{\Sigma f} - \dfrac{(\Sigma fd)^2}{(\Sigma f)^2}}$

Answer: D

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10. The variance of the first n-natural numbers is

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

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

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

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

Answer: A

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11. The mean of discrete observations $y_1, y_2, ... Y_n$ is given by

A. $\dfrac{\sum\limits_{i=1}^{n} y_i}{n}$

B. $\dfrac{\sum\limits_{i=1}^{n} y_i}{\sum\limits_{i=1}^{n} i}$

C. $\dfrac{\sum\limits_{i=1}^{n} y_i f_i}{n}$

D. $\dfrac{\sum\limits_{i=1}^{n} y_i f_i}{\sum\limits_{i=1}^{n} f_i}$

Answer: A

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12. If the variance of observations $x_1, x_2 . . . x_n$ is. σ^2 , then the variance of $ax_1, ax_2 . . ax_n, a \neq 0$ is

A. σ^2

B. $\alpha\sigma^2$

C. $\alpha^2\sigma^2$

D. $\dfrac{\sigma^2}{\alpha^2}$

Answer: C

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

A. 8λ

B. 7λ

C. 6λ

D. 5λ

Answer: A

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14. The variance of the data 2, 4, 6, 8, 10 is

A. 6

B. 7

C. 8

D. none of these.

Answer: C

15. The coefficient of mean deviation is

A. $\dfrac{\text{mean deviation}}{\text{mean}}$

B. $\dfrac{\text{mean}}{\text{mean deviation}}$

C. $\dfrac{\text{standart deviation}}{\text{mean}}$

D. $\dfrac{\text{mean}}{\text{standard deviation}}$

Answer: C