MEASURES OF CENTRAL TENDENCY ASSIGNMENT

1. Which one of the following measures of marks is the most suitable one of central location for computing intelligence of students

(a) Mode (b) Arithmetic mean (c) Geometric mean (d) Median

2. The central value of the set of observations is called

(a) Mean (b) Median (c) Mode (d) G.M.

3. For a frequency distribution 7th decile is computed by the formula

(a) $D_7 = l + \frac{\left(\frac{N}{7} - C\right)}{f} \times i$ (b) $D_7 = l + \frac{\left(\frac{N}{10} - C\right)}{f} \times i$ (c) $D_7 = l + \frac{\left(\frac{7N}{10} - C\right)}{f} \times i$ (d) $D_7 = l + \frac{\left(\frac{10N}{7} - C\right)}{f} \times i$

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

(a) 50th percentile (b) 5th decile (c) 2nd quartile (d) Lower quartile

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

(a) 10 (b) 12 (c) 14 (d) 11

6. The relation between the median *M*, the second quartile Q_2, the fifth decile D_5 and the 50th percentile P_{50}, of a set of observations is

(a) $M = Q_2 = D_5 = P_{50}$ (b) $M < Q_2 < D_5 < P_{50}$ (c) $M > Q_2 > D_5 > P_{50}$ (d) None of these

7. For a symmetrical distribution $Q_1 = 25$ and $Q_3 = 45$, the median is

(a) 20 (b) 25 (c) 35 (d) None of these

8. 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) $\alpha - \frac{5}{4}$ (b) $\alpha - \frac{1}{2}$ (c) $\alpha - 2$ (d) $\alpha + \frac{5}{4}$

9. The upper quartile for the following distribution

Size of items	1	2	3	4	5	6	7
Frequency	2	4	5	8	7	3	2

is given by the size of

(a) $\left(\frac{31+1}{4}\right)$th item (b) $\left[2\left(\frac{31+1}{4}\right)\right]$th item (c) $\left[3\left(\frac{31+1}{4}\right)\right]$th item (d) $\left[4\left(\frac{31+1}{4}\right)\right]$th item

10. For a continuous series the mode is computed by the formula

(a) $l + \frac{f_{m-1}}{f_m - f_{m-1} - f_{m+1}} \times C$ or $l + \left(\frac{f_1}{f_m - f_1 - f_2}\right) \times i$ (b) $l = \frac{f_m - f_{m-1}}{f_m - f_{m-1} - f_{m+1}} \times C$ or $l + \frac{f_m - f_1}{f_m - f_1 - f_2} \times i$

(c) $l + \frac{f_m - f_{m-1}}{2f_m - f_{m-1} - f_{m+1}} \times C$ or $l + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times i$ (d) $l + \frac{2f_m - f_{m-1}}{f_m - f_{m-1} - f_{m+1}} \times C$ or $l + \frac{2f_m - f_1}{f_m - f_1 - f_2} \times i$

11. 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

12. The mode of the following items is 0, 1, 6, 7, 2, 3, 7, 6, 6, 2, 6, 0, 5, 6, 0

(a) 0 (b) 5 (c) 6 (d) 2

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

(a) *K* (b) *K* + 10 (c) $K + \sqrt{10}$ (d) 10*K*

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

(a) $M > M_d > M_0$ (b) $M < M_d < M_0$ (c) $M = M_d M_0$ (d) $M = M_d = M_0$

15. For a frequency distribution mean deviation from mean is computed by

(a) M.D. $= \frac{\sum d}{\sum f}$ (b) M.D. $= \frac{\sum fd}{\sum f}$ (c) M.D. $= \frac{\sum f|d|}{\sum f}$ (d) M.D. $= \frac{\sum f}{\sum f|d|}$

16. 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

17. The S.D. of the first *n* natural numbers is

(a) $\frac{n+1}{2}$ (b) $\sqrt{\frac{n(n+1)}{2}}$ (c) $\sqrt{\frac{n^2-1}{12}}$ (d) None of these

18. Quartile deviation for a frequency distribution

(a) $Q = Q_3 - Q_1$ (b) $Q = \frac{1}{2}(Q_3 - Q_1)$ (c) $Q = \frac{1}{3}(Q_3 - Q_1)$ (d) $Q = \frac{1}{4}(Q_2 - Q_1)$

19. The variance of the first *n* natural numbers is

(a) $\frac{n^2-1}{12}$ (b) $\frac{n^2-1}{6}$ (c) $\frac{n^2+1}{6}$ (d) $\frac{n^2+1}{12}$

20. For a moderately skewed distribution, quartile deviation and the standard deviation are related by

(a) S.D. $= \frac{2}{3}$ Q.D. (b) S.D. $= \frac{3}{2}$ Q.D. (c) S.D. $= \frac{3}{4}$ Q.D. (d) S.D. $= \frac{4}{3}$ Q.D.

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

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

22. For a frequency distribution standard deviation is computed by

(a) $\sigma = \frac{\sum f(x-\bar{x})}{\sum f}$ (b) $\sigma = \frac{\sqrt{\sum f(x-\bar{x})^2}}{\sum f}$ (c) $\sigma = \sqrt{\frac{\sum f(x-\bar{x})^2}{\sum f}}$ (d) $\sigma = \sqrt{\frac{\sum f(x-\bar{x})}{\sum f}}$

23. If Q.D is 16, the most likely value of S.D. will be

(a) 24 (b) 42 (c) 10 (d) None of these

24. If M.D. is 12, the value of S.D. will be

(a) 15 (b) 12 (c) 24 (d) None of these

25. The range of following set of observations 2, 3, 5, 9, 8, 7, 6, 5, 7, 4, 3 is

(a) 11 (b) 7 (c) 5.5 (d) 6

26. If *v* is the variance and σ is the standard deviation, then

(a) $v^2 = \sigma$ (b) $v = \sigma^2$ (c) $v = \frac{1}{\sigma}$ (d) $v = \frac{1}{\sigma^2}$

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

(a) σ^2 (b) $\lambda^2\sigma^2$ (c) $\lambda + \sigma^2$ (d) $\lambda^2 + \sigma^2$

28. 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) $\lambda^2 + \sigma^2$

29. 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

30. For a given distribution of marks mean is 35.16 and its standard deviation is 19.76. The co-efficient of variation is

(a) $\frac{35.16}{19.76}$ (b) $\frac{19.76}{35.16}$ (c) $\frac{35.16}{19.76} \times 100$ (d) $\frac{19.76}{35.16} \times 100$

31. If 25% of the item are less than 20 and 25% are more than 40, the quartile deviation is

(a) 20 (b) 30 (c) 40 (d) 10

32. For a normal curve, the greatest ordinate is

(a) $2\pi\sigma$ (b) $\sigma\sqrt{2\pi}$ (c) $\frac{1}{\sqrt{2\pi\sigma}}$ (d) $\frac{1}{\sigma\sqrt{2\pi}}$

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

(a) σ^2 (b) $a\sigma^2$ (c) $a^2\sigma^2$ (d) $\frac{\sigma^2}{a^2}$

34. The mean deviation from the mean for the set of observations –1, 0, 4 is

(a) $\sqrt{\frac{14}{3}}$ (b) 2 (c) $\frac{2}{3}$ (d) None of these

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

(a) $\frac{7}{2}, \sqrt{\frac{35}{12}}$ (b) 3, 3 (c) $\frac{7}{2}, \sqrt{3}$ (d) $3, \frac{35}{12}$

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

(a) 40 (b) 45 (c) $40+\frac{21}{25}$ (d) None of these

37. The S.D of 15 items is 6 and if each item is decreased by 1, then standard deviation will be

(a) 5 (b) 7 (c) $\frac{91}{15}$ (d) 6

38. The sum of squares of deviations for 10 observations taken from mean 50 is 250. The co-efficient of variation is

(a) 50% (b) 10% (c) 40% (d) None of these

39. One set containing five numbers has mean 8 and variance 18 and the second set containing 3 numbers has mean 8 and variance 24. Then the variance of the combined set of numbers is

(a) 42 (b) 20.25 (c) 18 (d) None of these

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

(a) 2 and 9 (b) 3 and 8 (c) 4 and 7 (d) 5 and 6

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

(a) 4 and 8 (b) 4 and 9 (c) 5 and 7 (d) 5 and 9

42. Consider any set of observations $x_1, x_2, .x_3, ..., x_{101}$; it being given that $x_1 < x_2 < x_3 < .... < x_{100} < x_{101}$; then the mean deviation of this set of observations about a point *k* is minimum when *k* equals

(a) x_1 (b) x_{51} (c) $\frac{x_1 + x_2 + ... + x_{101}}{101}$ (d) x_{50}

43. The mean and S.D of the marks of 200 candidates were found to be 40 and 15 respectively. Later, it was discovered that a score of 40 was wrongly read as 50. The correct mean and S.D respectively are

(a) 14.98, 39.95 (b) 39.95, 14.98 (c) 39.95, 224.5 (d) None of these

44. Let *r* be the range and $S^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$ be the S.D. of a set of observations $x_1, x_2, ...x_n$, then

(a) $S \le r\sqrt{\frac{n}{n-1}}$ (b) $S = r\sqrt{\frac{n}{n-1}}$

(c) $S \ge r\sqrt{\frac{n}{n-1}}$ (d) None of these

45. In any discrete series (when all values are not same) the relationship between M.D. about mean and S.D. is

(a) M.D. = S.D. (b) M.D. ≥ S.D. (c) M.D. < S.D. (d) M.D. ≤ S.D.

46. For (2*n* +1) observations $x_1, -x_1, x_2, -x_2, ...x_n, -x_n$ and 0 where *x*'s are all distinct. Let S.D. and M.D. denote the standard deviation and median respectively. Then which of the following is always true

(a) S.D. < M.D. (b) S.D. > M.D.

(c) S.D. = M.D. (d) Nothing can be said in general about the relationship of S.D. and M.D.

47. Suppose values taken by a variable *X* are such that $a \le x_i \le b$ where x_i denotes the value of *X* in the i^{th} case for *i* = 1, 2, …. *n*. Then

(a) $a \le \text{Var}(X) \le b$ (b) $a^2 \le \text{Var}(X) \le b^2$ (c) $\frac{a^2}{4} \le \text{Var}(X)$ (d) $(b-a)^2 \ge \text{Var}(X)$

48. The variance of α, β and γ is 9, then variance of 5α, 5β and 5γ is

(a) 45 (b) $\frac{9}{5}$ (c) $\frac{5}{9}$ (d) 225

49. The mean of discrete observations $y_1, y_2, ..., y_n$ is given by

(a) $\frac{\sum_{i=1}^{n} y_i}{n}$ (b) $\frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} i}$ (c) $\frac{\sum_{i=1}^{n} y_i f_i}{n}$ (d) $\frac{\sum_{i=1}^{n} y_i f_i}{\sum_{i=1}^{n} f_i}$

50. 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