Shri Swami Vivekanand Shikshan Sanstha's

Raje Ramrao Mahavidyalaya, Jath

Department of Statistics

B.Sc- I Sem- I

Mathematical Statistics Paper-I

Question Bank

Multiple choice Questions

1. The method of collecting data from entire population is called…….
   (A) Census method (B) Sampling method
   (C) Both (A) and (B) (D) None of these
2. Annual income of the person is ……..
   (A)An attribute (B) A discrete variable
   (C) A continuous variable (D) (B) or (C)
3. The number of observations belonging to a class is called……
   (A)Class frequency (B) Cumulative frequency
   (C) Class width (D) None of these
4. From less than ogive curve we can obtain……
   (A)Mean (B) Median (C) Mode (D) All of these
5. Mode can be obtained from …….
   (A)Pie diagram (B) Histogram
   (C) Less than ogive curve (D) Greater than ogive curve
6. In case of frequency distribution, the heights of bars of a histogram are proportional to……..
   (A)Class frequency (B) Class intervals
   (C) Frequencies in percentage (D) Frequency densities
7. In case of frequency distribution, the bases of bars of a histogram are equal to……..
   (A)Class frequency (B) Class intervals
   (C) Frequencies in percentage (D) Frequency densities
8. The method of collecting data from entire population is called…….
   (A)Census method (B) Sampling method
   (C) Both (A) and (B) (D) None of these
9. Annual income of the person is ……..
   (A)An attribute (B) A discrete variable
   (C) A continuous variable (D) (B) or (C)
10. The number of observations belonging to a class is called……
    (A)Class frequency (B) Cumulative frequency
    (C) Class width (D) None of these
11. From less than ogive curve we can obtain……
    (A)Mean (B) Median (C) Mode (D) All of these

12. Mode can be obtained from …….

(A)Pie diagram (B) Histogram

(C) Less than ogive curve (D) Greater than ogive curve

13. In case of frequency distribution, the heights of bars of a histogram are proportional to……..

(A)Class frequency (B) Class intervals

(C) Frequencies in percentage (D) Frequency densities

14. In case of frequency distribution, the bases of bars of a histogram are equal to……..

(A)Class frequency (B) Class intervals

(C) Frequencies in percentage (D) Frequency densities

15. The data can be measured by using non-numeric notation or unordered symbols in.....

(A)Nominal scale (B) Interval scale (C) Ordinal scale (D) Ratio scale

16. If from each observation a constant value 30 is subtracted then the mean of the set is.....

(A)Increased by 30 (B) Decreased by 30

(C) Not affected (D) 30 times the original

17. In the case of finding average speed the measure to be used is .....

(A)Mean (B) Geometric Mean

(C) Harmonic Mean (D) Median

18. For a positively skewed distribution the relation between mean, median and mode is.....

(A)Mean > Median > Mode (B) Mean = Median = Mode

(C) Mean < Median < Mode (D) None of these

19. All observations are increased by 5 then median becomes……

(A)Remains same (B) Increased by 5 (C) Decreased by 5 (D)None of these

20. Empirical relation between mean, median and mode is…….

(A)Mean - Mode = 3 (Mean - Median)

(B)Mode - Mean = 3 (Mean - Median)

(C) Mean - Median 3 (Mean - Mode)

(D)None of these

21. For any distribution.....

(A) H.M. $\leq$ G.M. $\leq$ A.M. (B) H.M. $\leq$ A.M. $\leq$ G.M.

(C) G.M. $\leq$ H.M. $\leq$ A.M. (D) H.M. = G.M. = A.M.

22. The sum of absolute deviations of observations taken from median is always……..

(A)Zero (B) One (C) Minimum (D) Maximum

23. Graphically we can determine .using ogives.

(A) Standard deviation (B) Quartile deviation

(C)Mean deviation (D) Arithmetic mean

24. All the items are taken into consideration in.....
(A)Mode (B) Standard deviation
(C) Quartile deviation (D) None of these

25. To compare consistency of observations among two sets of data, we can use as the most efficient measure of dispersion**.**
(A) Range (B) Quartile deviation
(C) Mean deviation (D) Coefficient of variation

26. If each observation in the set is divided by 15 then the standard deviation of the new sets…….of original standard deviation.
(A)15 times (B) (1/15) times (C) 225 times (D) (1/225) times

27. The sum of absolute deviations of observations taken from median is always.....
(A)Zero (B) One (C) Minimum (D) Maximum

28. If the coefficient of variation and standard deviation of a series are 60% and 20 respectivelythen the value of the arithmetic mean is…….....
(A) 100/6 (B) 100/3 (C) 3/100 (D) 6/100

29. If the Standard deviation of X is 10 then the standard deviation of 5X-10 is…….
(A) 10 (B) 15 (C) 40 (D) 50

30. S.D. is affected by.....
(A)Change of origin only (B) Change of scale only
(C) Change of origin and change of scale (D) Change of scale but not by change of origin

31. If we want to know dispersion quickly we calculate…….....
(A)AM (B) Range (C) Median (D) Geometric mean

32. Mean deviation is minimum when calculated from….....
(A)Mean (B) Median (C) Mode (D) Geometric Mean

33. The measure of dispersion that is not based on all the observation is…….
(A)MD about mean (B) Range
(C) Standard deviation (D) None of these

34. If each value is increased by 10 then the standard deviation is…....
(A)Increased by 10 (B) Decreased by 10
(C) Not affected (D) None of these

35. The coefficient of variation of a frequency distribution having standard deviation 10 and mean 25 is.....
(A) 10 (B) 25 (C) 40 (D) 50

36. For open end classes an appropriate measure of dispersion to be used is…….
(A)Range (B) Quartile deviation
(C) Standard deviation (D) All of these

37. The distribution is symmetric if..moments are zero.
(A)Even ordered central (B) Odd ordered central
(C) Odd ordered raw (D) All raw and central moments

38. If the mean, median and mode of distribution are 5, 6, 7 respectively then the distribution is.....
(A)Symmetric (B) Negatively skewed
(C) Positively skewed (D) None of these

39. For a symmetric distribution…….
(A) $Q_3 - Q_2 < Q_2 - Q_1$ (B) $Q_3 - Q_2 > Q_2 - Q_1$
(C) $Q_3 - Q_2 = Q_2 - Q_1$ (D) $Q_3 - Q_2$ G $Q_2 - Q_1$

40. If the third central moment is zero then.....
(A) $Q_1 = 0$ (B) $\beta_2 = 0$
(C) Frequency distribution is symmetric (D) Only (A) and (B) are true

41. For negatively skewed distribution the correct relation between mean, median and mode is.....
(A)Mean < Median < Mode (B) Mode < Median < Mean
(C) Median < Mean < Mode (D) Median > Mean > Mode

42. Two distributions are of the same size and same mean, but different standard deviations, 6and 10. Then their combined standard deviation is.....
(A) 16 (B) 4 (C) 60 (D) 8

43. The first moment about the origin is…….
(A)Standard deviation (B) Mean deviation
(C) Variance (D) None of these

44. If for a distribution mean = 1, variance = 3, $\mu_3 = 0$ and $\mu_4 = 27$ then the given distribution is.....
(A)Positively skewed (B) Negatively skewed
(C) Symmetric (D) Either positively or negatively skewed

45. When Bowley's coefficient of skewness is ±1 then a quartile is equal to…….
(A)Mode (B) Mean (C) Median (D) Geometric Mean

46. In the case of n attributes, total number of ultimate class frequencies is
(A) 2^n (B) 3^n (C) 3n (D) 2n

47. If attributes A and B are completely dissociated then coefficient of association is
(A) 2^n (B) 3^n (C) 3n (D) 2n

48. In the case of n dichotomous attributes, total number of ultimate classes is
(A) 2^n (B) 3^n (C) n^2 (D) n^3

49. The coefficient of association always lies between
(A) 0 and 1 (B) 0 and - ∞
(C) -1 and 1 (D) -1 and 0

50. If dichotomous attributes A and B are independent then
(A) $\frac{(AB)}{(\beta)} = \frac{(A\beta)}{(\beta)}$ (B) $\frac{(AB)}{(A)} = \frac{(\alpha B)}{(B)}$
(C) (Aβ)(αβ) = (Aβ)(αβ) (D) All the above

Long answers Questions

1. Define the terms with example

   i) Class Interval ii) Class Limit iii) Class Width iv) Class Frequency

   v) Class marks.
2. Explain nominal, ordinal, interval, ratio scale of measurement.
3. Define median and derive the formula of the median for grouped frequency distribution.
4. Define mode and derive the formula of the mode for grouped frequency distribution.
5. Define A.M, G.M, and H.M. for two observation show that $H.M \leq G.M \leq A.M$.
6. Define mean deviation. State and prove minimal property of mean deviation.
7. Define Standard deviation and drive the formula for combined standard deviation for two sets.
8. Define raw and central moments. Obtain the relationship between raw and central moments for first two moments.
9. Define geometric mean. State and prove it's any two properties.
10. Obtain relation between Yule's coefficient of association (Q) and coefficient of colligation (Y). Hence deduce that $|Q| \geq |Y|$

Short answers Questions

1. Describe briefly various stages in the collection of data?
2. Explain primary and secondary data.
3. What do you mean by (i) inclusive (ii) Exclusive method of class interval.
4. Explain nominal and ordinal scale of measurement.
5. What are requisites of a good average?
6. Define arithmetic mean and state its property.
7. Define arithmetic mean and what is the effect of change of origin and scale on arithmetic mean?
8. Define quartiles deciles and percentiles.
9. Explain the method of finding median graphically.
10. Define geometric and harmonic mean.
11. What is dispersion? Distinguish between absolute and relative measures of dispersion.
12. Define range and quartile deviation.
13. Discuss the effect of origin and scale on standard deviation.
14. Find the mean and the variance of the distribution which takes value 1, 2, 3,…., n each with frequency unity.
15. Define standard deviation and give its merits.
16. What is skewness? State and explain different type of skewness.
17. What is effect of change of origin and scale on raw and central moments?
18. Define r'th moment about i) origin ii) mean iii) arbitrary value A.
19. Define i) Attributes ii) Class iii)Class order iv) Ultimate class v)Positive class
20. What is the condition of consistency of data? Find the condition of consistency of data related to two attributes A and B.