

P.G. STATISTICS

1. The statement, "Statistics is the both a science and an art", was given by":
(A) R. A. Fisher (B) Tippet
(C) L. R. Connor (D) A. L. Bowley
2. The word 'statistics' is used as :
(A) Singular (B) Plural
(C) Singular and plural both (D) None of the above
3. Whether classification is done first or tabulation ?
(A) Classification follows tabulation
(B) Classification precedes tabulation
(C) Both are done simultaneously
(D) No criterion
4. Which of the following is a one dimensional diagram ?
(A) Bar diagram (B) Pie-chart
(C) Cylinder (D) Pyramid
5. A frequency distribution can be
(A) Discrete (B) Continuous
(C) Both (A) and (B) (D) None of (A) and (B)
6. If there in an increase in a series at constant rate, the graph will be a :
(A) Convex curve
(B) Parabola
(C) Concave curve
(D) A straight line from left bottom to right top

7. Histogram can be used only when :
- (A) Class interval are equal or unequal
 - (B) Class interval are all equal
 - (C) Class interval are unequal
 - (D) Frequencies in class interval are equal
8. In an ogive curve, the points are plotted for :
- (A) The values and the frequencies
 - (B) The values and the cumulative frequencies
 - (C) Frequencies and the cumulative frequencies
 - (D) None of the above
9. If a constant 5 is added to each observation of a set, the mean is :
- (A) Increased by 5
 - (B) Decreased by 5
 - (C) 5 times the original mean
 - (D) Not affected
10. If the group data has open end classes, one cannot calculate :
- (A) Median
 - (B) Mode
 - (C) Mean
 - (D) Quartile
11. Harmonic mean is better than other means if the data are for :
- (A) Speed or rate
 - (B) Heights or lengths
 - (C) Binary values like 0 or 1
 - (D) Ratios or proportions
12. The correct relationship between A.M., G.M., and H.M. is
- (A) $A.M. = G.M. = H.M.$
 - (B) $G.M. \geq A.M. \geq H.M.$
 - (C) $H.M. \geq G.M. \geq A.M.$
 - (D) $A.M. \geq G.M. \geq H.M.$
13. Extreme values have no effect on :
- (A) Average
 - (B) Median
 - (C) Geometric mean
 - (D) Harmonic mean

14. The middle value of an ordered series is called :
- (A) 2nd quartile (B) 5th decile
(C) 50 percentile (D) All of the above
15. Sum of the deviation about mean is :
- (A) Zero (B) Minimum (C) Maximum (D) One
16. Sum of the absolute deviations about median :
- (A) Maximum (B) Minimum
(C) Zero (D) None of the above
17. Mean deviation is minimum when deviation are taken from :
- (A) Mean (B) Median (C) Mode (D) Zero
18. For a group of 100 students, the mean was found to be 40. Later on it was discovered that the value 45 was misread as 54. The correct mean is :
- (A) 40.50 (B) 39.91 (C) 39.85 (D) 39.80
19. The Arithmetic mean of two numbers is 6.5 and their geometric mean is 6. The two numbers are :
- (A) 9, 4 (B) 6, 7 (C) 5, 9 (D) 6, 9
20. The variance of first n natural numbers is :
- (A) $(n^2 + 1)/12$ (B) $(n + 1)^2/12$
(C) $(n^2 - 1)/12$ (D) $(2n^2 - 1)/12$
21. Sum of squares of deviations is minimum when deviations are taken from :
- (A) Mean (B) Median (C) Mode (D) Zero

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22. The unit less measure of dispersion is :
- (A) Standard deviation (B) Mean deviation
(C) Range (D) Coefficient of variation
23. In a distribution of 10, 20, 30, 40, 50, the x is 30, the sum of deviations from x will be
- (A) 0 (B) 60 (C) 30 (D) 15
24. If a constant value 5 is subtracted from each observation of a set, the variance is :
- (A) Reduced by 5 (B) Reduced by 25
(C) Unaltered (D) Increased by 25
25. The mean of dispersion which ignores signs of the deviations from a central value is :
- (A) Range (B) Quartile deviation
(C) Standard deviation (D) Mean deviation
26. The standard deviation of a set of values will be :
- (A) Positive when the value are positive
(B) Positive when the value are negative
(C) Always positive
(D) All of the above
27. All the values sample are same. Then their variance is :
- (A) Zero (B) One
(C) Not calculable (D) All of the above
28. Classical probability is also known as :
- (A) Laplace's probability (B) Mathematical probability
(C) A priori probability (D) All of the above

29. Probability is expressed as :

- (A) Ratio (B) Proportion
(C) Percentage (D) All of the above

30. If A and B are two events, the probability of occurrence of either A or B is given as :

- (A) $P(A) + P(B)$ (B) $P(A \cup B)$
(C) $P(A \cap B)$ (D) $P(A)P(B)$

31. The probability distribution whose mean and variance are equal

- (A) Binomial (B) Negative binomial
(C) Poisson (D) Normal

32. If an event B has occurred and it is known that $P(B) = 1$, the conditional probability $P(A/B)$ is equal to :

- (A) $P(A)$ (B) $P(B)$ (C) One (D) Zero

33. The idea of posteriori probabilities was introduced by

- (A) Pascal (B) Pater and Paul
(C) Thomas Bayes (D) M. Loe've

34. With a pair of dice thrown at a time, the probability of getting a sum more than that of 9 is :

- (A) $5/18$ (B) $7/36$
(C) $5/6$ (D) None of the above

35. If E_1, E_2, \dots, E_n is a countable sequence of events such that $E_i \leq E_{i+1}$ for $i = 1, 2, \dots$ then :

- (A) $\lim_{n \rightarrow \infty} P(E_n) = 0$ (B) $\lim_{n \rightarrow \infty} P(E_n) = \infty$
(C) $\lim_{n \rightarrow \infty} P(E_n) = 1$ (D) None of these

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36. The probability that a leap year will have 53 Sundays is :

- (A) $1/7$ (B) $2/7$ (C) $2/5$ (D) $52/53$

37. A coin is tossed six times. The probability of obtaining heads and tails alternately is :

- (A) $1/2$ (B) $1/32$
(C) $1/64$ (D) None of these

38. For two events A_1 and A_2 , if $P(A_1) = 2/3$, $P(A_2) = 3/8$ and $P(A_1 \cap A_2) = 1/4$, then A_1 and A_2 are :

- (A) Mutually exclusive but not independent
(B) Mutually exclusive and independent
(C) Independent but not mutually exclusive
(D) Not mutually exclusive and not independent

39. If X is a random variable, $E(e^{tX})$ is known as :

- (A) Characteristic function
(B) Moment generating function
(C) Probability generating function
(D) All of the above

40. The heights of fathers and their sons form bi-variate variable which are :

- (A) Continuous variable (B) Discrete variable
(C) Pseudo variables (D) None of the above

41. If X and Y are two independent variable, then

- (A) $E(XY) = E(X)E(Y)$ (B) $\text{Cov}(X, Y) = 0$
(C) $\rho_{xy} = 0$ (D) All of the above

42. Sampling frame is a term used for :
- (A) A list of random number
 - (B) A list of voters
 - (C) A list of sampling units of a population
 - (D) None of the above
43. The most important factor in determining the size of sample is :
- (A) The availability of resources
 - (B) Purpose of survey
 - (C) Heterogeneity of population
 - (D) None of the above
44. If the observation in a set of observations are same, the variance of the set of values is :
- (A) Zero
 - (B) One
 - (C) Infinity
 - (D) Not possible to calculate
45. If n units are selected in a sample from N population units, the sampling fraction is given as :
- (A) $\frac{N}{n}$
 - (B) $1/N$
 - (C) $1/n$
 - (D) n/N
46. Systematic sampling means :
- (A) Selection of n contiguous units
 - (B) Selection of n units situated at equal distance
 - (C) Selection of n largest units
 - (D) Selection of n middle units in a sequence
47. The concept of consistency, efficiency and sufficiency are due to :
- (A) J. Neyman
 - (B) R. A. Fisher
 - (C) C. R. Rao
 - (D) J. Berkson

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48. The hypothesis under test is :
- (A) Simple hypothesis (B) Alternative hypothesis
(C) Null hypothesis (D) None of the above
49. Power of a test is related to :
- (A) Type I error (B) Type II error
(C) Type I and II errors both (D) None of the above
50. Degrees of freedom for Chi-square in case of contingency table of order (3*4) are :
- (A) 12 (B) 9 (C) 8 (D) 6
51. Analysis of variance utilizes :
- (A) F-test (B) χ^2 -test (C) Z-test (D) t-test
52. The range of statistic χ^2 is :
- (A) - 1 to 1 (B) $-\infty$ to ∞ (C) 0 to ∞ (D) 0 to 1
53. Range of the variance ratio F is :
- (A) - 1 to 1 (B) $-\infty$ to ∞ (C) 0 to ∞ (D) 0 to 1
54. Reduction in the size of a test results into :
- (A) Decrease in its power (B) Increase in its power
(C) No change in its power (D) All the above
55. Nonparametric methods are based on :
- (A) Mild assumption (B) Stringent assumption
(C) No assumption (D) None of the above

56. Most of the non-parametric methods utilize measurement on :

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

57. The range of coefficient of determination is

- (A) - 1 to 1 (B) 0 to ∞ (C) 0 to 1 (D) - 1 to 0

58. The range of r , is :

- (A) - 1 to 1 (B) 0 to 1 (C) $-\infty$ to ∞ (D) 0 to ∞

59. Kolmogorov-Smirnov test is useful as :

- (A) A test of goodness of fit
(B) A test of identicalness of two population
(C) A measure of confidence band
(D) All of the above

60. The term regression was introduced by :

- (A) R. A. Fisher (B) Sir Francis Galton
(C) Karl Pearson (D) None of the above

61. If X and Y are independent, the value of regression coefficient β_{xy} , is equal to :

- (A) 0 (B) 1
(C) ∞ (D) Any positive value

62. The point of intersection of two regression lines is (X, Y) which is also equal to :

- (A) (X^2, Y^2) (B) (\bar{X}, \bar{Y})
(C) $(0, 0)$ (D) $(1, 1)$

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63. If $\rho = 0$, the lines of regression are :
- (A) Coincident (B) Parallel
(C) Perpendicular (D) None of the above
64. If the correlation between the two variable X and Y is negative. The regression coefficient of Y and X is :
- (A) Positive (B) Negative
(C) Not certain (D) None of the above
65. Regression coefficient is independent of the change of :
- (A) Scale (B) Origin
(C) Both origin and scale (D) Neither origin nor scale
66. The correlation between two variables is unit, there is :
- (A) Perfect correlation (B) Perfect positive correlation
(C) Perfect negative correlation (D) No correlation
67. A time series is a set of data recorded :
- (A) Periodically (B) At a time or space interval
(C) At successive points of time (D) All of the above
68. The time series analysis refers to :
- (A) Univariate data (B) Bi-variate data
(C) Univariate or Bi-variate data (D) Multivariate data
69. The component of time series attached to long-term variations is terms as :
- (A) Cyclic variation (B) Secular trend
(C) Irregular variation (D) All of the above

70. Seasonal variations means the variation occurring within :
- (A) A number of years (B) Parts of a years
(C) Parts of a month (D) None of the above
71. Moving average method of fitting trend in a time series data removes the effect of :
- (A) Long-term movement (B) Short-term movement
(C) Cyclic-variation (D) None of the above
72. Least square estimate of parameter of a trend line :
- (A) Have minimum variance (B) Are unbiased
(C) Can exactly be obtained (D) All of the above
73. If the origin in a trend equation is shifted forward by three years, X in the equation $Y = a + bX$ will be replaced by :
- (A) $X - 3$ (B) $X + 3$
(C) $3X$ (D) None of the above
74. Index number are expressed :
- (A) In percentage (B) In ratios
(C) In terms of absolute value (D) All of the above
75. The condition for price indices to satisfy the circular test for four years data is :
- (A) $P_{01} P_{12} P_{23} P_{30} = 1$ (B) $P_{01} P_{12} P_{23} P_{34} = 1$
(C) $P_{01} + P_{12} + P_{23} = P_{43}$ (D) $P_{01} + P_{12} + P_{34} = 1$
76. Fisher's ideal formula not satisfy :
- (A) Time reversal test (B) Circular test
(C) Factor reversal test (D) Unit test

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77. Index of industrial production measures the change in :
- (A) The quantum of production (B) The value of production
(C) The demand of industrial goods (D) None of the above
78. Factor reversal test permits the interchange of :
- (A) Base periods (B) Price and quantity
(C) Weights (D) None of the above
79. Chance or random variation in the manufactured product is :
- (A) Controllable (B) Not controllable
(C) Both (A) and (B) (D) None of the above
80. Variance due to assignable cause in the product occurs due to :
- (A) Faulty process (B) Carelessness of operation
(C) Poor quality of raw material (D) All of the above
81. The fault due to assignable causes :
- (A) Can be removed (B) Cannot be removed
(C) Can sometime be removed (D) All of the above
82. Control chart consists of :
- (A) Three control lines (B) Upper and lower control line
(C) The level of the process (D) All of the above
83. The probability of rejecting a lot having \bar{P} as the process average defective is known as :
- (A) Consumer's risk (B) Type II error
(C) Producer's risk (D) All of the above

84. The probability of accepting a lot with fraction defective P is known as :
- (A) Consumer's risk (B) Type II error
(C) Producer's risk (D) None of the above
85. A curve showing the probability of accepting a lot of quality P is known as :
- (A) OC curve (B) A. S. N. curve
(C) Compertz curve (D) None of the above
86. Vital statistic is mainly concerned with :
- (A) Births (B) Deaths
(C) Population of regions (D) All the above
87. Life-table has also been named as :
- (A) Mortality table (B) Survival table
(C) Life expectancy (D) All of the above
88. The vital index for population growth was propounded by :
- (A) B. Benjamin (B) G. Bareley
(C) A. Newsholmes (D) Rayond Pearl
89. Randomization is a process in which the treatments are allocated to the experimental units :
- (A) At the will of the investigator (B) In a sequence
(C) With equal probability (D) None of the above
90. Replication in an experiment eliminates :
- (A) The number of blocks
(B) Total number of treatment
(C) The number of times a treatment occurs in an experiment
(D) None of the above

91. A randomized block design has :

- (A) Two way classification
- (B) One way classification
- (C) Three way classification
- (D) No classification

92. Error sum of square RBD as compared to CRD using the same material is :

- (A) More
- (B) Less
- (C) Equal
- (D) Not comparable

93. Which of the following is true ?

- (A) Having more than one dependent variable allows the examination of interactions between them.
- (B) There must be the same number of independent variables as there are dependent variables.
- (C) An experiment can have more than one dependent variable.
- (D) An experiment can only have one dependent variable.

94. The graphical method of LP problem uses

- (A) Objective function equation
- (B) Constraint equations
- (C) Linear equations
- (D) All of the above

95. To formulate a problem for solution by the Simplex method, we must add artificial variables to

- (A) Only equality constraints
- (B) Only 'greater than' constraints
- (C) Both (A) and (B)
- (D) None of the above

96. The matrix is called as a skew symmetric if :

- (A) $A = A^2$
- (B) $A = A'$
- (C) $A = -A'$
- (D) $A = \bar{A}$

97. The rank of a matrix A in a system of linear equations is also equal to the rank of an augmented matrix $[A, b]$ then it is called :
- (A) Inconsistent (B) Consistent
(C) Unique (D) No solution
98. Inverse of a square matrix exists iff the matrix is :
- (A) Singular (B) Non-singular
(C) Symmetric (D) Diagonal
99. The annual growth rate of a time series data can be obtained from the regression equation $y = a + bx$ is :
- (A) The term a (B) The term b
(C) Both a and b (D) The value of y
100. Correlation and Regression analysis are used for which type of data ?
- (A) Nominal data (B) Ordinal data
(C) Metric data (D) Interval scale data
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