**Subject Code: 17MCA2C9**

**JAMAL MOHAMED COLLEGE (Autonomous)**

**TIRUCHIRAPPALLI – 620 020**

**Objective Type Questions**

**Department of Computer Science**

**Semester: II UG / PG: PG-MCA**

**Title of the Paper : Core-IX : NUMERCIAL AND STATISTICAL METHODS**

**UNIT - 1**

1. Errors due to finite representation of numbers are called \_\_\_\_

a. Absolute errors b. relative errors

c. round off Errors d. Truncation errors

2. Errors due to finite representation of an inherently infinite process is called \_\_\_\_

a. Percentage errors b. relative errors

c. round off Errors d. Truncation errors

3.\_\_\_\_\_\_ error is the numerical difference between the true value of a quantity and its approximate value.

a. Absolute b. relative

c. percentage d. epsilon

4. Every polynomial equation of the nth degree has \_\_\_\_\_\_\_\_ roots.

a. n b. n+1

c. n-1 d. n+2

5. If f(x) is continuous in the interval [a, b] and f (a) &f (b) are of opposite signs, then the equation f(x) =0 has at least one root between\_\_\_\_\_\_\_\_\_\_\_

a. f(a) & f(b) b. a & b

c. f(a) & a d. b&f(b)

6. An equation which contains trigonometric, hyperbolic, logarithmic or exponential functions is called \_\_\_\_\_\_\_ equation.

a. Transcendental b. algebraic

c. polynomial d. linear

7. The interval in which a real root of the equation x3 – 2x-5 =0 lies is \_\_\_\_\_\_\_\_

a. (1,2) b. (0,1)

c. (2,3) d. (-5,-4)

8. The Newton-Raphson method of finding roots of nonlinear equations falls under the category of \_\_\_\_\_\_\_\_\_\_\_\_\_methods.

a. Bracketing b. open

c. random d. graphical

9. The order of convergence of Newton-Raphson method is \_\_\_\_\_\_

a. linear b. quadratic

c. cubic d. bi-qudratic

10. The Newton-Raphson method fails when

a. f ‘( x) is negative b. f ‘( x) is too large

c. f’ ( x) is zero d . f(x) is positive

11. The condition for convergence of successive approximation method is for solving x=g(x) is \_\_\_\_\_\_\_\_\_\_

a. g'(x)=1 b. | g' (x) | < 1

c.| g' (x) | >1 d.| g' (x) | >= 1

12. The matrix derived from the coefficients and constant terms of a system of linear equations is called the \_\_\_\_ matrix of the system.

a. augmented b. coefficient

c. upper triangular d. lower triangular

13. In the Gauss elimination method for solving a system of linear algebraic equations, triangularzation leads to \_\_\_\_\_\_\_\_\_\_ matrix.

a. Diagonal b. Singular

c. upper triangular d. lower triangular

14. In Gauss elimination procedure, changing the order of equations to avoid zero element on the diagonal is called \_\_\_\_\_.

a. pivoting b. Ill-conditione systems

c. norm of the matrix d. diagonal matrix.

15. A system of linear equations is said to be \_\_\_\_\_\_ when small variation in the system can produce large changes in the exact solution.

a. Well-conditioned b. ill-conditioned

c. proper-conditioned d. highly accurate

16. In solving simultaneous equations by Gauss-Jordan method, the coefficient matrix is reduced to \_\_\_\_\_\_\_\_\_\_

a. Unit Matrix b. Diagonal Matrix

c. Null Matrix d. Square Matrix

17. A sufficient condition for convergence of \_\_\_\_\_\_\_ method is that the system

of equations is diagonally dominant.

a. Gauss-elimination b. Gauss-Jordon

c. Gauss-Seidel d.Gauss –Jacobi.

18. Gauss elimination and gauss Jordan methods are \_\_\_\_\_\_\_methods.

a. Direct b. Indirect

c. Iterative d. Interpolation.

19. Gauss-Seidel method is used to solve the system of \_\_\_\_\_\_ equations.

a. Transcendental b. quadratic

c. linear algebraic d. cubic

20. What is the augmented matrix for the given system?

 

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| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

**UNIT- II**

21. The method of estimating unknown value with the help of given set of observations is known as \_\_\_\_\_\_

a. Estimation b .Interpolation

c. Evaluation d. Extrapolation

22. \_\_\_\_\_\_ is the process of estimating a value of f(x) that lies outside the range of the known base points x1, x2, …, xn

a. Estimation b. Interpolation

c. Evaluation d. Extrapolation

23. \_\_\_\_\_\_ is the process of finding the value of x for some given value of f(x) when the given value of f(x) is between two tabulated values of f(x).

a .Estimation b. Inverse interpolation

c. Evaluation d. Inverse Extrapolation.

24. Newton's forward difference interpolation formula is used for

a. Equal interval b. Unequal interval

c. central difference d. divided difference

25. Interpolation with equal intervals at the end of the table is done using\_\_\_\_\_\_\_\_\_\_

a. Newton forward formula b. Newton backward formula

c. Newton divided difference formula d. Gauss forward formula

26. ∆2y0 = \_\_\_\_\_\_

a. y2 – 2y1 + y0 b. y2 – 2y1 + y3

c. y2 + 2y1 - y0 d. y2 + 2y1 + y0

27. Lagrange’s interpolation formula is used for\_\_\_\_\_

a. Equal interval b. unequal interval

c. both equal and unequal intervals d. Differential equation

28.  The backward difference operator is denoted by \_\_\_\_\_\_\_

a.∆ b.∇

c.𝛿 d. λ

29.The process of evaluating a definite integral from data given by a set of tabulated values is called \_\_\_\_\_\_\_\_\_\_\_ integration.

a. Numerical b. analytical

c. quadratic d. tabular

30. The trapezoidal rule is based on approximating the integrand by a \_\_\_\_\_\_ polynomial.

a. Second order b. third order

c. first-order d. fourth order

31. Simpson’s 1/3 rule is based on approximating the integrand by a \_\_\_\_\_\_ polynomial.

a. Second order b. third order

c. first-order d. fourth order

32. Simpson's 1/3rd rule, the number of subintervals should be\_\_\_\_\_\_.

a. Odd number b. even number

c. multiples of 3 d. any number

33. While evaluating a definite integral by Trapezoidal rule, the accuracy can be increased by

taking \_\_\_\_\_\_\_\_\_\_\_

a. Large number of sub-intervals b. less number of sub-intervals

c. odd number of intervals d. Even number of intervals

34. In Simpson’s 1/3 rule the number of ordinates should be \_\_\_\_\_\_\_.

a. Odd number b. even number

c. multiples of 3 d. any number

35. The error in trapezoidal rule is of the order \_\_\_\_\_

a. h b. h2

c. h3 d. h4

36. The error in Simpson’s 1/3 rule is of the order \_\_\_\_\_

a. h b. h2

c. h3 d. h4

37. Which of the following is a single step method?

a. Newton's method b. Adams-Bashforth's method

c. Adams-Moulton's method d. Runge-Kutta's method

38. yi+1 = yi + h f (xi , yi) is the iterative formula for

a. Euler’s method b. Taylor’s method

c. Adam’s method d. Milne’s method

39. Runge-Kutta method is used to\_\_\_\_\_\_\_\_

a. Solve algebraic equations b. evaluate definite integral

c. Solve ordinary differential equations d. solve difference equations.

40. In Runge-Kutta fourth order method K4 = - - - -

a. hf(x1 + h , y1 + K3) b. hf(x1 + h , y1 + K2)

c. hf(x1 + h , y1 + K1) d. f(x1 + h , y1 + K3)

**UNIT- III**

41. The collection of one or more outcomes from an experiment is called

a. Probability b. Event

c. Random Variable d. Random Experiment

42. In which approach to probability the outcomes are equally likely to occur?

a. Classical Probability b. Subjective Probability

c. Relative Frequency d. Independent

43. In probability theories, events which can never occur together are classified as

a. collectively exclusive events b. mutually exhaustive events

c. mutually exclusive events d. collectively exhaustive events .

44. In measuring probability of any certain event, zero represents

a. impossible events b. possible events

c. certain event d. sample event

45. Probability of second event in situation if first event has been occurred is classified as

a. series probability b. conditional probability

c. joint probability d. dependent probability

46. For a random experiment, all possible outcomes are called

a. numerical space b. event space

c .sample space d. both b and c

47. Important rules in computation of experimental outcomes includes

a. multiple experiments b. permutations

c. combinations d. all of above

48. Probability of events must lie in limits of

a. one to two b. two to three

c. one to two d. zero to one

49. Event such as equal chance of heads or tails while tossing coin is an example of

a. numerical events b. equally likely events

c. unequal events d. non-numerical events

50. In a Venn diagram used to represent probabilities, occurred events are represented by

a. circle b. rectangle c. square d. triangle

51. In probability theories, collection of all events possible outcomes from an experiment is classified as

a. mutually exclusive events b. collectively exhaustive events

c. collectively exclusive events d. mutually exhaustive events

52. If a coin is tossed one time then probability of occurrence of heads is

a. 1⁄2 b. 1⁄1

c. 2⁄1 d. 2⁄2

53. Probability of event A that does not occur in experiment is equal to

a. 1 - P(A) b. 1 + P(A)

c. 1 × P(A) d. 2 - P(A)

54. Sample space for experiment in which two coins are tossed is

a. 8 b. 4

c. 2 d. 10

55. Conditional probability of two events Y and Z written as P(Z|Y) = P(Y and Z) ⁄ P(Y) shows that events are

a. statistically dependent events b. descriptive unaffected events

c. statistically independent events d. statistically unaffected events

56. Conditional probability of two independent events Y and Z can be written as

a. P(Y - Z) b. P(Y \* Z)

c. P(Y|Z) d. P(Y + Z)

57. According to combination rule, if total number of outcomes are 'r' and distinct outcome collection is 'n' then combinations are calculated as

a. n! ⁄ r!(n - r)! b. n! ⁄ r!(n + r)!

c. r! ⁄ n!(n - r)! d. r! ⁄ n!(n + r)!

58. Two dice are rolled, find the probability that the sum is equal to 1

a. 1 b. 2

c. 4 d. 0

59. A card is drawn at random from a deck of cards. Find the probability of getting a queen.

a. 1 / 13. b. 1/4

c. 1/2 d. 1/26

60. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

a. 3 / 4 b. 4 / 7

c. 1 / 8 d. 3 / 7

**UNIT- IV**

61**.** A random variable is also called

a. Variable b. Constant

c. Attribute d. Chance Variable

62. If *X* is a random variable '*a'* and *'b'* are constants then E(aX + b) is

a. E(aX) + b b. E(aX) + E(b)

c. aE(X) + b d. None of these

63. If *X* and *Y* are independent random variables then E(XY) is equal to

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| a. E(X). Y b. E(X).E(Y)  c. E(X) + E(Y) d. X. E(Y)  64. If *X*and *Y* are independent random variable then VAR(X - Y)is  a. Var(X) - Var(Y) b. Var(X). Var(Y)  c. Var(X) + Var(Y) d. Var(X) / Var(Y)  65. A random variable X  a. may no moments although its mgf exists.  b. can have mgf and some (or all) moments, yet the mgf does not  generate the moments.  c. can have all or some moments, but mgf does not exist except perhaps  at one point.  d. all of them.  66. The moments generating function of a random variable X, M x (t) is  a. E(X) b. E(X 2)  c. E( etx ) d. None of them.  67. In binomial probability distribution, dependents of standard deviations must includes  a. probability of q b. probability of p  c. trials d. all of above |
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|  |
|  |

68. In binomial distribution, formula of calculating standard deviation is

a. square root of p b. square root of pq

c. square root of npq d. square root of np

69. Formula in which Poisson probability distribution approaches normal probability distribution with help of normal variable is written as

a. x + λ ⁄ square root of λ b. x \* λ ⁄ square root of x\*λ

c. x - λ ⁄ square root of λ d. x + λ ⁄ square root of pqλ

70. In binomial distribution, formula of calculating mean is

a. μ = p + q b. μ = np

c. μ = pq d. μ = qn

71. In binomial probability distribution, success and failure generated by trial is respectively denoted by

a. p and q b. n and b

c. p + q d. p – q

72. Mean of binomial probability distribution is 857.6 and probability is 64% then number of values of binomial distribution

a. 1040 b. 1340 c. 1240 d. 1140

73. The mean and variance are equal for:

a. all probability distributions b. the binomial probability distribution

c. the Poisson probability distribution d. all of them.

74. Which probability distribution is applied when the probability of a success is very small?

a. The binomial probability distribution b. The Poisson probability distribution

c. The empirical probability distribution d. The binomial distribution with n = 10 and π = 0.5

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| 75. http://highered.mheducation.com/olcweb/styles/shared/spacer.gifIn general, a discrete probability distribution requires that: |
| a. all outcomes must have the same probability of success. | |
| b. the probabilities for all possible outcomes must sum to 1.00. | |
| c. the probability of success must be less than 0.1. | |
| d. the events must be dependent. | |
|  | |
| 76. http://highered.mheducation.com/olcweb/styles/shared/spacer.gifIn a continuous probability distribution, the random variable: |
| a. is limited to certain values. | |
| b. may be any value within a certain range. | |
| c. may have a probability greater than 1.00. | |
| d. is discrete.  77. If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is  a. −1.5 b. −1.2  c. −1.7 d. −4  78. The normal distribution is a \_\_\_\_\_ distribution.  a. discrete b. continuous  c. rectangular d. positively skewed  79. A normal distribution can be characterized as a/an \_\_\_\_\_distribution.   |  | | --- | |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | | |

a. bell-shaped b. symmetric

c. asymmetric d. All of them.

80. Which of the following is not a characteristic of the normal distribution?

a. it is a symmetrical distribution b. the mean is always zero

c. the mean, median and mode are equal d. it is a bell-shaped distribution

**UNIT - V**

81. Cluster sampling, stratified sampling and systematic sampling are types of

a. direct sampling b. indirect sampling

c. random sampling d.non random sampling

82. Quota sampling, judgment sampling and convenience sampling are classified as

types of

a. random sampling b. non random sampling

c. direct sampling d. indirect sampling

83. Type of stratified proportion sampling in which information is gathered on convenience basis from different groups of population is classified as

a. purposive sampling b. judgment sampling

c. quota sampling d. convenience sampling

84. In statistical analysis, sample size is considered large if

a. n > or = 30 b. n < or = 30 c. n > or = 50 d. n < or = 50

85. Method of sampling in which population is divided in to mutual exclusive groups that have useful context in statistical research is classified as

a. stratified sampling b. regular group sampling

c. irregular group sampling d. direct group sampling

86. In systematic sampling, population is 200 and selected sample size is 50 then sampling interval is

a. 250 b. 0.25

c. 4 d. 40

87. All values in sample distribution that can freely varies in selected random sample from population are indicated as

a. degree of freedom b. degree of error

c. degree of statistic d. degree of possibility

88. Procedure of selecting desired portion from population which describes characteristics of whole population is

a. sampling b. extracting

c. deviation of sample d. variability of sample

89. In stratified sampling, sample drawn randomly from strata is classified as

a. sub strata b. sub sample c. direct sub group

d. indirect sub group

90. Type of sampling in which desired and useful information is gathered from best position

holder is classified as

a. quota sampling b. convenience sampling

c. purposive sampling d. judgment sampling

91. In sample distribution, degree of freedom is calculated as

a. df = n- 2 b. df = n- 1

c. df = n- 3 d. df = n- 5

92. In statistical analysis, sample size is considered small if

a. n > 50 b. n < 50

c. n > 30 d. n < 30

93. Method of sampling in which random sampling will not be possible because population is widely spread is classified as

a. secondary stage sampling b. multistage sampling

c. primary stage sampling d. sub stage sampling

94. An important application of the chi-square distribution is

a. making inferences about a single population variance

b. testing for goodness of fit

c. testing for the independence of two variables

d. All of these alternatives are correct.

95. While applying chi-square test to a contingency table of 4 rows and 4 columns, the degrees of freedom would be:

a. 1 b. 4

c. 9 d. 8

96. The null hypothesis for the Chi-Square test of independence should specify

a. that the two numerical variables are dependent

b. that the two numerical variables are independent

c. that the two categorical variables are independent

d. that the two categorical variables are dependent

97. The chi-square test can be used:

a. to make inference about a population mean

b. for pairwise multiple comparisons of means.

c. to test for homogeneity of proportions.

d. to test for difference in two variances.

98. To determine whether a set of observed frequencies differ from their corresponding expected frequencies, we could apply the

a. t test for independent samples. b. F test.

c. t test for dependent samples. d. chi-square test.

99. When using the chi-square test for differences in two proportions with a contingency table that has r rows and c columns, the degrees of freedom for the test statistic will be:

a. (r - 1)(c - 1). b. n1 – 1

c. n1 + n2 – 2 d. (r - 1) + (c - 1).

100. Which of the following test is used to determine two independent estimates of population variance?

a. t test for independent samples. b. F test.

c. t test for dependent samples. d. chi-square test.

**ANSWERS WITH EXPANSION**

1. c, round off Errors

2. d. Truncation errors

3. a. Absolute

4. a. n

5. b. a & b

6. a. Transcendental

7. c. (2,3)

8. b. open

9. b. quadratic

10. c. f’ ( x) is zero

11. b. | g' (x) | < 1

12. a. augmented

13. c. upper triangular

14. a. pivoting

15. b. ill-conditioned

16. b. Diagonal Matrix

17. c. Gauss-Seidel

18. a. Direct

19. c. linear algebraic

20. c.



21. b .Interpolation

22. d. Extrapolation

23. b. Inverse interpolation

24. a. Equal interval

25. b. Newton backward formula

26. a. y2 – 2y1 + y0

27. c. both equal and unequal intervals

28. b.∇

29. a. Numerical

30. c. first-order

31. b. third order

32. b. even number

33. a. Large number of sub-intervals

34. a. Odd number

35. b. h2

36. d. h4

37. d. Runge-Kutta's method

38. a. Euler’s method

39. c. Solve ordinary differential equations

40. a. hf(x1 + h , y1 + K3)

41. b. Event

42. a. Classical Probability

43. c. mutually exclusive events

44. a. impossible events

45. b. conditional probability

4 6. d. both b and c

47. d. all of above

48. d. zero to one

49. b. equally likely events

50. a. circle

51. b. collectively exhaustive events

52. a. 1⁄2

53. a. 1 - P(A)

54. b. 4

55. a. statistically dependent events

56. c. P(Y|Z)

57. a. n! ⁄ r!(n - r)!

58. d. 0

59. a. 1 / 13

60. b. 4 / 7

61**.**  d. Chance Variable

62. c. aE(X) + b

63. b. E(X).E(Y)

64. c. Var(X) + Var(Y)

65. d. all of them

66. c. E( etx )

67. d. all of above

68. c. square root of npq

69. b. n →∞ and neither p nor q is very small

70. b. μ = np

71. a. p and q

72. b. 1340

73. c . the Poisson probability distribution

74. b. The Poisson probability distribution

75. c. the probability of success must be less than 0.1.

76. b. may be any value within a certain range.

77. b. −1.2

78. b. continuous

79. d. All of them

80. b. the mean is always zero

81**.**  c. random sampling

82. b. non random sampling

83. c. quota sampling

84. a. n > or = 30

85. a. stratified sampling

86. c. 4

87. a. degree of freedom

88. a. sampling

89. b. sampling

90. d. judgment sampling

91. b. df = n- 1

92. d. n < 30

93. b. multistage sampling

94. d. All of these alternatives are correct

95. c . 9

96. c. that the two categorical variables are independent

97. c . to test for homogeneity of proportions

98. d. chi-square test

99. a . (r - 1)(c - 1)

100. b F test