

K. S. R. COLLEGE OF ENGINEERING, TIRUCHENGODE - 637 215
DEPARTMENT OF MATHEMATICS
18MA343 - NUMERICAL COMPUTATIONAL TECHNIQUES
MULTIPLE CHOICE QUESTIONS

1. Every polynomial equation of the n th degree has _____ roots.

- A. n
- B. $n+1$
- C. $n+2$
- D. $n-1$

ANSWER: A

2. If $f(x) = 0$ has a root between a & b then $f(a)$ & $f(b)$ are of _____ signs.

- A. opposite
- B. same
- C. negative
- D. positive

ANSWER: A

3. If two of the roots are $1-i$ & 2 , then the 3rd degree equation is _____. A. $x^3 - 21x^2 + 6x - 4 = 0$.

- B. $x^3 - 4x^2 + 6x + 4 = 0$
- C. $x^3 - 4x^2 + 6x - 4 = 0$
- D. $x^3 + 4x^2 + 6x - 4 = 0$

ANSWER: C

4. Which method gives a unique set of values to the constants in the equation of the fitting curves?

- A. Horner's method
- B. Method of least squares
- C. Interpolation
- D. Newton's Method

ANSWER: B

5. A polynomial of the form $y = ax^2 + bx + c$ is called _____.

- A. linear equation
- B. Second degree equation
- C. reciprocal equation
- D. bi quadratic equation

ANSWER: B

6. The line obtained by the method of least square is known as the line of _____.

- A. straight line
- B. second degree equation
- C. best fit
- D. polynomial equation

ANSWER: C

7. The sum of deviation of the actual values of Y and the computed values of Y is _____.
A. 0
B. 1
C. Maximum
D. Minimum

ANSWER: A

8. In the function $y = f(x)$, the independent variable x is called _____.
A. entry
B. argument
C. intermediate
D. interpolation

ANSWER: B

9. The relationship between E and delta is _____.
A. $E = 1 - \delta$
B. $E = 1 + \delta$
C. $E = \delta - 1$
D. $E = \delta$

ANSWER: B

10. The relationship between E and small delta is _____.
A. small delta = $1 - E$
B. small delta = $E - 1$
C. small delta = $(E - 1) - 1$
D. small delta = $E^{(1/2)} - E^{(-1/2)}$

ANSWER: D

11. Choose the correct one.
A. $E = e h D = 1 - \delta$
B. $E = e h D = 1 + \delta$
C. $E = e - h D = 1 + \delta$
D. $E = 1 / e h D = 1 / 1 + \delta$

ANSWER: B

12. In the function $y = f(x)$, the dependent variable y is called _____.
A. entry
B. argument
C. intermediate
D. interpolation

ANSWER: A

13. Iteration method is a _____ method
A. direct
B. indirect
C. self correcting
D. step by step

ANSWER: C

14. Gauss Elimination Method & Gauss Jordan Methods are _____ methods.
A. direct
B. indirect

- C. self correcting
- D. step by step

ANSWER: A

15. The rate of convergence of Gauss Seidel Method is _____ that of Gauss Jacobi Method.

- A. once
- B. twice
- C. thrice
- D. reciprocal

ANSWER: B

16. _____ method is very fast compared to other methods.

- A. Gauss Elimination
- B. Gauss Jordan
- C. Gauss Seidel
- D. Gauss Jacobi

ANSWER: C

17. The order of convergence of Regula-Falsi method is _____.

- A. 2
- B. 1.172
- C. 1.618
- D. 1.17

ANSWER: C

18. The Newton Raphson Method is also called _____.

- A. Bolzano's Bisection Method
- B. Iterative Method
- C. Method of Tangents
- D. Newton's Method

ANSWER: C

19. The order of Newton Raphson Method is _____.

- A. 1
- B. 2
- C. 3
- D. 4

ANSWER: B

20. The modification of Gauss Elimination Method is _____.

- A. Gauss Jordan Method
- B. Gauss Jacobi Method
- C. Gauss Elimination Method
- D. Gauss Seidel Method

ANSWER: A

21. If α, β, γ are the roots of the equation $x^3 - 14x + 8 = 0$, then product of the roots is _____.

- A. -8
- B. -18
- C. 28

D. 38

ANSWER: C

22. _____ method is used for finding the dominant Eigen-value of a matrix.

- A. Gauss Elimination Method
- B. Gauss Jordan Method
- C. Newton Raphson Method
- D. Power method

ANSWER: D

23. Euler corrector is _____.

- A. $Y_{n+1} = Y_n + hY_n$.
- B. $Y_{n+1} = Y_n + h/2(Y_n + Y_{n+1})$
- C. $Y_{n+1} = Y_n + h/2(Y'_n + Y'_{n+1})$
- D. $Y_{n+1} = Y'_n - hY'_n$

ANSWER: D

24. Let f is _____ on (a, b) and $f(a) < f(b)$. Then bisection method generates a sequence $\{P_n\}$ approximating a zero p of f with $|P_n - p|$ less than or equal to $(b-a)/2^n$, n greater than or equal to 1.

- A. continuous function
- B. discontinuous function
- C. constant function
- D. multivariate function

ANSWER: A

25. In Euler's method: Given initial value problem $y' = dy/dx = f(x, y)$ with $y(x_0) = y_0$, the approximation is given by _____.

- A. $y_{n+1} = y_n + hf(x_{n-1}, y_{n-1})$
- B. $y_{n+1} = y_n + hf(x_n, y_n)$
- C. $y_{n+1} = y_n + hf(x_{n-1}, y_n)$
- D. $y_{n+1} = y_n + hf(x_n, y_{n-1})$

ANSWER: B

26. $y(x+h) = y(x) + h f(x,y)$ is referred as _____ method.

- A. Euler
- B. Modified Euler
- C. Taylor's Series
- D. Runge-Kutta

ANSWER: A

27. When more than one value is involved then the problem is known as _____. A. initial Value Problem.

- B. boundary Value Problem
- C. interpolation
- D. extrapolation

ANSWER: B

28. The error in the trapezoidal rule is of the order _____.

- A. h
- B. h^2
- C. h^3

D. h^4

ANSWER: B

29. The error in the Simpson's rule is of the order _____.

A. h

B. h^2

C. h^3

D. h^4

ANSWER: D

30. Romberg's method is also known as _____.

A. Trapezoidal rule

B. Simpson's (1/3)rd Rule

C. Simpson's (3/8)th Rule

D. Rombergs Integration

ANSWER: D

31. Simpson's 1/3rd rule of integration is exact for all polynomials of degree not exceeding _____.

A. 1

B. 2

C. 3

D. 4

ANSWER: B

32. Simpson's 3/8th rule is applicable only when _____.

A. n is a multiple of 3

B. n is a multiple of 6

C. n is a multiple of 8

D. n is a multiple of 24

ANSWER: A

33. In Simpson's 1/3rd rule the number of intervals must be _____.

A. a multiple of 3

B. a multiple of 6

C. odd

D. even

ANSWER: D

34. The order of Euler method is _____.

A. h

B. h^2

C. h^3

D. h^4

ANSWER: B

35. _____ method is used for finding the approximate solution either rational or irrational of numerical equation.

A. Euler

B. Taylor

- C. Horner's
- D. Modified Euler

ANSWER: C

36. The two segment trapezoidal rule of integration is exact for integrating at most _____ order polynomials.

- A. first
- B. second
- C. third
- D. fourth

ANSWER: A

37. The process of finding the equation of the curve of best fit, which may be most suitable for predicting the unknown values, is known as _____.

- A. curve fitting
- B. theory of equations
- C. interpolation
- D. extrapolation

ANSWER: B

38. Newton-Raphson method is applicable to find the solution of _____.

- A. both algebraic and transcendental equations
- B. both algebraic and transcendental and also used when the roots are complex
- C. algebraic equations only
- D. transcendental equations only

ANSWER: A

39. _____ is used to denote the process of finding the values inside the interval (X_0, X_n) .

- A. Interpolation
- B. Extrapolation
- C. Iterative
- D. Polynomial equation

ANSWER: A

40. The forward difference operator is denoted by the symbol _____.

- A. delta
- B. omega
- C. nabla
- D. infinity

ANSWER: A

41. The backward difference operation is denoted by the symbol _____.

- A. nabla
- B. delta
- C. omega
- D. infinity

ANSWER: A

42. In Newton's forward interpolation formula the first two terms will give the _____ interpolation.

- A. linear
- B. parabolic
- C. hyperbolic
- D. polynomial equation

ANSWER: A

43. Lagrange's interpolation formula is used to compute the values for _____ intervals.

- A. equal
- B. unequal
- C. open
- D. closed

ANSWER: B

44. Newton forward interpolation formula is used for _____ intervals.

- A. equal
- B. unequal
- C. open
- D. closed

ANSWER: A

45. Fourth degree equations are also called _____ equations.

- A. quadratic
- B. cubic
- C. linear
- D. bi-quadratic

ANSWER: D

46. Let the arithmetic mean of two numbers be 9 and the geometric mean be 4, then these numbers are the roots of the quadratic equation _____.

- A. $x^2 + 18x + 16 = 0$
- B. $x^2 - 18x - 16 = 0$
- C. $x^2 + 18x - 16 = 0$
- D. $x^2 - 18x + 16 = 0$

ANSWER: D

47. If $(1-p)$ is a root of quadratic equation $x^2 + px + (1-p) = 0$, then its roots are_____.

- A. (0, 1)
- B. (-1, 2)
- C. (0, -1)
- D. (-1, 1)

ANSWER: C

48. If one root of the equation $x^2 + px + 12 = 0$ is 4 and the equation $x^2 + px + q = 0$ have equal roots, then the value of q is_____.

- A. $49/4$
- B. 4
- C. 3
- D. 12

ANSWER: A

49. If the graph of the function $y = f(x)$ is symmetrical about the line $x = 2$, then_____.

- A. $f(x+2)=f(x-2)$
- B. $f(2+x)=f(2-x)$
- C. $f(x) = f(-x)$
- D. $f(x) = - f(-x)$

ANSWER: B

50. If the system of linear equations $x + 2ay + az = 0$; $x + 3by + bz = 0$; $x + 4cy + cz = 0$ have a non-zero solution, then a, b, c_____.

- A. are in Arithmetic Progression
- B. are in Geometric Progression
- C. are in Harmonic Progression
- D. satisfy $a+2b+3c=0$

ANSWER: C

51. If the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals, then a/c , b/a , and c/b are in_____.

- A. are in Arithmetic Progression
- B. are in Geometric Progression
- C. are in Harmonic Progression
- D. are in Arithmetic and Geometric Progression

ANSWER: C

52. In the function $y = f(x)$ the dependent variable is _____.

- A. y
- B. x
- C. $f(x)$
- D. a constant

ANSWER: A

53. The first two terms of a GP add up to 12. The sum of the third and the fourth terms is 48.

If the terms of the GP are alternately positive and negative, then the first term is_____.

- A. -2
- B. -4
- C. -12
- D. 8

ANSWER: C

54. In the function $y=f(x)$ the independent variable is _____.

- A. y
- B. x
- C. $f(x)$
- D. a constant

ANSWER: B

55. The translation operator is denoted by _____.

- A. E
- B. nabla
- C. omega
- D. T

ANSWER: A

56. If the roots of the equation $x^2 - bx + c = 0$ are two consecutive integers, then $b^2 - 4ac =$

- _____.
- A. 1
 - B. 2
 - C. 3
 - D. -2

ANSWER: A

57. A smooth curve that can be drawn to pass through near the plotted points is called

- _____.
- A. curve fit
 - B. approximating curve
 - C. empirical curve
 - D. linear curve

ANSWER: B

58. The equation of approximate curve taken as an approximate relation between x and y is called _____.

- A. curve fit
- B. approximating curve
- C. empirical relation
- D. linear form

ANSWER: C

59. The general problem of finding equations of approximating curves which fit a given data is called _____.

- A. curve fitting
- B. approximating curve
- C. empirical relation
- D. linear form

ANSWER: A

60. The best representative curve to the given set of points for which the sum of the squares of the residuals is a minimum is known as _____.

- A. curve fitting
- B. approximating curve
- C. empirical relation
- D. principles of least squares

ANSWER: D

61. The _____ matrix in the normal equations is symmetric.

- A. square
- B. scalar
- C. co-efficient
- D. upper triangular

ANSWER: C

62. If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$, then the values of sum of $\alpha = \underline{\hspace{1cm}}$ and sum of $(\alpha\beta) = \underline{\hspace{1cm}}$.

- A. $-p$ and $-q$
- B. $-p$ and q
- C. p and $-q$
- D. p and q

ANSWER: B

63. If α, β, γ are the roots of the equation $x^4 + px^3 + qx^2 + rx + s = 0$, then the values of sum of $(\alpha\beta) = \underline{\hspace{1cm}}$ and sum of $(\alpha\beta\gamma) = \underline{\hspace{1cm}}$.

- A. $-p$ and $-q$
- B. q and $-r$
- C. q and r
- D. p and q

ANSWER: B

64. If α, β, γ are the roots of $x^3 + px + q = 0$, then the value of sum of $(1/\alpha) = \underline{\hspace{1cm}}$.

- A. p/q
- B. q/p
- C. $-p/q$
- D. $p^2/-q$

ANSWER: C

65. If α, β, γ are the roots of $x^3 - 3x + 1 = 0$, then the value $(\alpha)^2 + (\beta)^2 + (\gamma)^2 = \underline{\hspace{1cm}}$.

- A. 0
- B. 2
- C. 3
- D. 6

ANSWER: D

66. If α, β, γ are the roots of $x^3 + 2x + 1 = 0$, then the value $(\alpha)^2 + (\beta)^2 + (\gamma)^2 = \underline{\hspace{1cm}}$.

- A. 0
- B. 2
- C. 3
- D. 6

ANSWER: C

67. In an equation with rational coefficients, _____ roots must occur in conjugate pairs. A. irrational

- B. imaginary
- C. real
- D. complex

ANSWER: A

68. In an equation with real coefficients, _____ roots must occur in conjugate pairs. A. irrational.

- B. imaginary
- C. real

D. complex
ANSWER: D

69. A reciprocal equation of first class and odd degree has a root _____.
- A. 1
 - B. 2
 - C. -1
 - D. -2

ANSWER: C

70. A reciprocal equation of second class and even degree has the roots _____.
- A. 1 and -1
 - B. -1 and 2.
 - C. 2 and -2
 - D. -1 and 0

ANSWER: A

71. Standard reciprocal equation is of the form _____.
- A. second class and odd degree
 - B. second class and even degree
 - C. first class and odd degree
 - D. first class and even degree

ANSWER: D

72. Shifting operator is also called _____ operator.
- A. translation
 - B. averaging
 - C. differential
 - D. unit

ANSWER: A

73. _____ errors are due to computational procedure.
- A. Inherent
 - B. Round off
 - C. Truncation
 - D. Numerical

ANSWER: B

74. _____ errors are caused by using approximate formula in computation.
- A. Inherent
 - B. Round off
 - C. Truncation
 - D. Numerical

ANSWER: C

75. The number of _____ roots of $f(x) = 0$ does not exceed the number of changes of sign in $f(x)$.
- A. negative
 - B. positive
 - C. imaginary
 - D. complex

ANSWER: B

76. As soon as a new value for a variable is found by iteration, it is used immediately in the following equation. This method is called_____.
- A. Gauss Seidel
 - B. Gauss Elimination
 - C. Gauss Jacobi
 - D. Gauss Jordan

ANSWER: A

77. The first difference of a constant is_____.
- A. 0
 - B. 1
 - C. -1
 - D. -2

ANSWER: A

78. The nth difference of a polynomial of nth degree is_____.
- A. zero
 - B. polynomial of (n-1)th degree
 - C. constant
 - D. polynomial in first degree

ANSWER: C

79. A second order differential equation can be solved by reducing it to a lower _____ equation.
- A. ordinary differential
 - B. partial differential
 - C. polynomial
 - D. interpolation

ANSWER: A

80. The methods of second category are called _____ methods.
- A. direct
 - B. indirect
 - C. point wise
 - D. step by step

ANSWER: C

81. In an ordinary differential equation the first category method is_____.
- A. Taylor method
 - B. Euler method
 - C. Modified Euler Method
 - D. RungeKuttaMehtod

ANSWER: A

82. In which of the following methods proper choice of initial value is very important?
- A. Newton Raphson Mehtod
 - B. Bisection Method
 - C. Iterative Method
 - D. Regula Falsi Method

ANSWER: A

83. An equation which expresses a relation between the independent and dependent variable is called _____ equation.
- A. difference equation
 - B. ordinary differential equation
 - C. partial differential equation
 - D. quadratic equation

ANSWER: A

84. A function which satisfies the differential equations is called _____ of a differentialequation.
- A. solution
 - B. general solution
 - C. particular solution
 - D. complete solution

ANSWER: A

85. _____ of differential equation is a solution got form the general solution by givingparticular values to the arbitrary constant.
- A. A solution
 - B. A general solution
 - C. A particular solution
 - D. A complete solution

ANSWER: C

86. For unequal intervals, we can use _____ to get the derivative value.
- A. Newton Forward Interpolation Formula
 - B. Newton Backward Interpolation Formula
 - C. Lagrange's Interpolation Formula
 - D. Newton Difference Formula

ANSWER: D

87. To find the derivative for the start value(lies between) of the table _____ formula is used.
- A. Newton Forward Interpolation Formula
 - B. Newton Backward Interpolation Formula
 - C. Newton Forward Difference Formula
 - D. Newton Backward Difference Formula

ANSWER: A

88. To find the derivative for the end value(lies between) of the table _____ formula is used.
- A. Newton Forward Interpolation Formula
 - B. Newton Backward Interpolation Formula
 - C. Newton Forward Difference Formula
 - D. Newton Backward Difference Formula

ANSWER: B

89. To find the derivative for the end value(lies on) of the table _____ formula is used.
- A. Newton Forward Interpolation Formula
 - B. Newton Backward Interpolation Formula
 - C. Newton Forward Difference Formula
 - D. Newton Backward Difference Formula

ANSWER: D

90. To find the derivative for the start value(lies on) of the table _____ formula is used.

- A. Newton Forward Interpolation Formula
- B. Interpolation Formula Newton Backward Interpolation Formula
- C. Newton Forward Difference Formula
- D. Newton Backward Difference Formula

ANSWER: C

91. If the value of derivative is required near the middle of the table we use _____ formula.

- A. Newton Forward Interpolation Formula
- B. Newton Forward Difference Formula
- C. Central Difference Formula
- D. Lanrange's Interpolation Formula

ANSWER: C

92. _____ is derived from Newton's Cotes Formula.

- A. Trapezoidal Rule
- B. Simson's (1/3)rd Rule
- C. Simpson's(3/8)th Rule
- D. WeddlesRule

ANSWER: A

93. Modification of _____ is called Romberg's method.

- A. Trapezoidal Rule
- B. Simson's (1/3)rd Rule
- C. Simpson's(3/8)th Rule
- D. WeddlesRule

ANSWER: A

94. The degree of $y(x)$ in Trapezoidal Rule is _____.

- A. 1
- B. 2
- C. 3
- D. 6

ANSWER: A

95. The degree of $y(x)$ in Simpson's (1/3) rd rule is _____.

- A. 1
- B. 2
- C. 3
- D. 6

ANSWER: B

96. The degree of $y(x)$ in Simpson's (3/8)th is _____.

- A. 1
- B. 2
- C. 3
- D. 6

ANSWER: C

97. In Simpson's (1/3) rd rule the number of intervals is _____.

- A. odd
- B. even

- C. multiple of 3
- D. multiple of 6

ANSWER: B

98. Interpolating polynomial is also known as_____.

- A. smoothing function
- B. interpolating function
- C. collocation polynomial
- D. interpolating formula

ANSWER: C

99. The method used to find the dominant Eigen value is _____.

- A. Gauss Method
- B. Newton's Method
- C. Euler's Method
- D. Power Method

ANSWER: D

100. The nth differences of a polynomial of _____ degree are constants.

- A. n
- B. n+1
- C. n+2
- D. n+3

ANSWER: A

101. The (n+1)th polynomial of a degree n is _____.

- A. n
- B. n+1
- C. a constant
- D. zero

ANSWER: D

102. Delta power two is called the _____order difference operator.

- A. first
- B. second
- C. third
- D. fourth

ANSWER: B

103. Nabla power 3 is called the _____order difference operator.

- A. first
- B. second
- C. third
- D. fourth

ANSWER: C

104. $f(x-h) =$ _____.

- A. $Ef(x)$
- B. $[E-1]f(x)$
- C. $[1/E]f(x)$
- D. $\text{deltaf}(x)$

ANSWER: B

105. The power method for approximating Eigen value is _____ method.

- A. iterative
- B. point-wise
- C. direct
- D. indirect

ANSWER: A

106. In Lagrange's interpolation formula, the value of $L_1(x_1) =$ _____.

- A. 0
- B. 1
- C. 2
- D. 3

ANSWER: A

107. Newton-Raphson method has a _____ convergence.

- A. linear
- B. quadratic
- C. cubic
- D. bi quadratic

ANSWER: B

108. If $f(x)$ is continuous in (a, b) and if $f(a)$ and $f(b)$ are of opposite signs, then the equation $f(x)=0$ will have at least _____ between a and b .

- A. two real roots
- B. one real root
- C. three real roots
- D. four roots

ANSWER: B

109. In the case of iteration method the convergence is _____.

- A. linear
- B. quadratic
- C. cubic
- D. bi quadratic

ANSWER: A

110. In the case of Newton-Raphson method the error at any stage is proportional to_____.

- A. the error in the previous stage
- B. the square of the error in the previous stage
- C. the cubic of the error in the previous stage
- D. square root of the error in the previous stage

ANSWER: B

111. The root of the equation $e^x = 4x$ lies between_____.

- A. (0, 1)
- B. (1, 2)
- C. (2, 3)
- D. (3, 4)

ANSWER: C

112. A root of the equation $x^x = 100$ lies between _____.

- A. (0, 1)
- B. (-1, -2)
- C. (-2, 3)
- D. (3, 4)

ANSWER: D

113. Backward substitution method is applied in _____.

- A. Gauss Elimination Method
- B. Gauss Seidal Method
- C. Gauss Jacobi Method
- D. Newton's Raphson Method

ANSWER: A

114. As soon as a new value for a variable is obtained by iteration, it is used immediately in the following equation. This method is called _____.

- A. Gauss Elimination Method
- B. Gauss Seidal Method
- C. Gauss Jacobi Method
- D. Gauss Jacobi Method

ANSWER: B

115. The algebraic sum of the errors in any difference column is _____.

- A. zero
- B. one
- C. constant
- D. same value

ANSWER: A

116. Numerical differentiation can be used only when the difference of some order are _____.

- A. equally spaced
- B. unequally spaced
- C. constant
- D. independent

ANSWER: C

117. Newton's divided difference formula is used only for _____ intervals.

- A. equal
- B. unequal
- C. open
- D. closed

ANSWER: B

118. If a set of numerical values of a single valued integral function $f(x)$, is applied to $\int f(x)$, then the process is known as _____.

- A. a numerical integration
- B. quadrature
- C. interpolation
- D. a numerical differentiation

ANSWER: A

119. In deriving the trapezoidal formula for the curve $y=f(x)$, each sub-interval is replaced by its_____.

- A. straight line
- B. ellipse
- C. chord
- D. tangent line

ANSWER: C

120. Simpson's rule will give exact result if the entire curve $y=f(x)$ is itself a _____

- A. straight line
- B. ellipse
- C. parabola
- D. tangent line

ANSWER: C

121. Taylor's series method will be very useful to give some initial starting values for powerful methods such as _____.

- A. Euler Method
- B. Modified Euler Method
- C. Newton Raphson Method
- D. RungeKuttaMethod

ANSWER: D

122. The modified Euler method is based on the average of _____.

- A. straight line
- B. ellipse
- C. chord
- D. points

ANSWER: D

123. Match the following: A. Newton Raphson 1. Integration B. Runge-kutta 2. Root finding C. Gauss-seidel 3. Ordinary Diferential Equations D. Simpson's Rule 4. Solution of system of Linear Equations Codes: ABCD

- A. 2341
- B. 3214
- C. 1423
- D. 1243

ANSWER: A

124. In numerical integration, to get better result, we select n as_____.

- A. even
- B. odd
- C. 1,2,3,4,5,6.....
- D. large as possible

ANSWER: D

125. In divided difference formula, the value of any difference is _____ of the order of their arguments.

- A. independent
- B. dependent
- C. inverse

D. transpose

ANSWER: A

126. The word Eigen value is derived from a German word Eigen meaning _____.

A. characteristic

B. substitute

C. dominant

D. least

ANSWER: A

127. For a transition matrix the dominant eigen value is always _____.

A. 0

B. 1

C. 2

D. 3

ANSWER: B

128. The divided difference formula is _____ in all their arguments.

A. asymmetrical

B. symmetrical

C. inverse

D. transpose

ANSWER: B

129. Which of the following states If $f(x)$ is three times differentiable and f', f'' are not zero for a solution of $f(x) = 0$, then x_0 sufficiently close to s ?

A. Newton's method of first order

B. Newton's method of second order

C. Newton's method of third order

D. Newton's divided difference method

ANSWER: B

130. In Newton-cotes formula, if $f(x)$ is interpolated at equally spaced nodes by a polynomial of degree two then it represents _____.

A. Trapezoidal rule

B. Simpson's one-third rule

C. Simpson's three-eighth rule

D. Euler's rule

ANSWER: B

131. In Newton-cotes formula, if $f(x)$ is interpolated at equally spaced nodes by a polynomial of degree three then it represents _____. A. Trapezoidal rule.

B. Simpson's one-third rule

C. Simpson's three-eighth rule

D. Euler's rule

ANSWER: C

132. Which of the following is true?

A. $\Delta = E - 1$

B. $\nabla = \Delta + 1$

C. $\Delta = \nabla + 1$

D. $\Delta = \nabla - 1$

ANSWER: A

133. Let h be the finite difference, then forward difference operator is defined by _____.

A. $f(x) = f(x+h) - f(x)$

B. $f(x) = f(x-h) - f(x)$

C. $f(x) = f(x \cdot h)$

D. $f(x) = f(x)$

ANSWER: A

134. There is at most one polynomial of degree less than or equal to n _____.

A. which interpolates $f(x)$ at $(n+1)$ distinct points x_0, x_1, \dots, x_n

B. which interpolates $f(x)$ at $(n-1)$ distinct points x_0, x_1, \dots, x_{n-1}

C. which interpolates $f(x)$ at n distinct points x_0, x_1, \dots, x_{n-2}

D. which interpolates $f(x)$ at $(n-1)$ distinct points x_0, x_1, \dots, x_{n-3}

ANSWER: A

135. A differential equation is said to be linear if _____.

A. the dependent variable and its differential co-efficient occur in the second degree

B. the dependent variable occurs in the first degree

C. the dependent variable and its differential co-efficient occur only in the first degree

D. the independent variable occurs in the first degree

ANSWER: C

136. The solution of a differential equation which contains number of arbitrary constants equal to the order of the differential equation is called the _____.

A. elementary solution

B. complementary function

C. particular solution

D. general solution

ANSWER: D

137. In the general solution of a differential equation, the arbitrary constants are _____.

A. dependent

B. independent

C. both dependent and independent

D. neither dependent nor independent

ANSWER: B

138. The simplest method in finding the approximate solutions to the first order equations is _____.

A. Euler's method

B. Modified Euler's Method

C. Runge-Kutta method

D. Taylor's Method

ANSWER: A

139. If a polynomial of degree n has more than n zeros, then the polynomial is _____.

A. oscillatory

B. zero everywhere

C. quadratic

D. not defined

ANSWER: B

140. To find the negative root of $f(x)=0$, we should find the corresponding positive root of _____ and change the sign.

- A. $f(x)=0$
- B. $f(x)=y$
- C. $f(-x)=y$
- D. $f(-x)=0$

ANSWER: C

141. To find the real root of a polynomial equation we use _____ method.

- A. Bisection
- B. Newton's
- C. Euler's
- D. Horner's

ANSWER: D

142. _____ method is faster than bi-section method.

- A. Gauss-elimination
- B. Newton's
- C. Horner's
- D. Regula-falsi

ANSWER: D

143. _____ method is slower than Newton's Raphson Method.

- A. Gauss-elimination
- B. Newton's
- C. Horner's
- D. Regula-falsi

ANSWER: D

144. The most popular Runge-Kutta method is _____.

- A. First order Runge-Kutta method
- B. Second order Runge-Kutta method
- C. Third order Runge-Kutta method
- D. Fourth order Runge-Kutta method

ANSWER: D

145. The convergence rate of the _____ method is poor, when two largest eigen values are nearly equal in magnitude.

- A. Power
- B. Newton's
- C. Euler's
- D. Bolzano's

ANSWER: A

146. _____ are best suited for finding a set of interpolation polynomials for increasing values of r .

- A. Newton forward and backward interpolation formula
- B. Newton and Backward difference formula

C. Lagrange's interpolation formula

D. Taylor's formula

ANSWER: A

147. The process of numerical integration of a function of a single variable is called_____.

A. Trapezoidal Rule

B. Simpson's Rule

C. Cubature

D. Quadrature

ANSWER: D

148. The process of numerical integration of a function of a two variable is called _____.

A. Trapezoidal Rule

B. Simpson's Rule

C. Cubature

D. Quadrature

ANSWER: C

149. Simpson's rule for evaluation of integral gives better result if $f(x) = 0$ represents_____.

A. a circle

B. a parabola

C. an ellipse

D. a hyperbola

ANSWER: B

150. The product and sum of the roots of the equation $x^5 - 2 = 0$ are _____ and _____.A.

(1,2)

B. (5,2)

C. (2,5)

D. (2,0)

ANSWER: D