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Paper Code		
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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No.

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प्रश्नपुस्तिका सीरीज
Question Booklet Series
D

B.C.A. (Fifth Semester) Examination, February/March-2022

BCA-504(N)

Numerical Methods

Time : 1:30 Hours

Maximum Marks-100

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

- निर्देश : —
1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही— सही भरे, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
 2. इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमें से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने हैं। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET) में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वाइंट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।
 3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
 4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
 5. ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
 6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक—पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
 7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : — प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।

Rough Work / रफ कार्य

1. Stirling formula is derived by taking mean of following formula :
 - (A) Gauss Forward and Gauss backward formula
 - (B) Gauss forward and Gauss third formula
 - (C) Gauss forward and Bessel's
 - (D) Gauss backward and Gauss third
2. Newton Raphson method is also called :
 - (A) Tangent method
 - (B) Regula-Falsi method
 - (C) Least square method
 - (D) None of above
3. Value of $E^{1/2}$ is equal to :
 - (A) $\mu + \frac{1}{2}\delta$
 - (B) $\mu - \frac{1}{2}\delta$
 - (C) $\delta + \frac{1}{2}\mu$
 - (D) $\delta - \frac{1}{2}\mu$
4. The value of $\Delta\nabla$ is equal to :
 - (A) $\Delta\nabla$
 - (B) δ^2
 - (C) Both (A) and (B)
 - (D) None of above
5. The following table is given :

x:	0	1	2	3	4
f(x):	3	6	11	18	27

What is form of f(x) ?

 - (A) $x^2 + 2x + 3$
 - (B) $x^2 + x + 1$
 - (C) $x^2 + 3x + 2$
 - (D) $2x^2 + 2x + 1$
6. Find f(1) where-

x:	2	3	4	5	6
f(x):	8	3	0	-1	0

 - (A) 16
 - (B) 17
 - (C) 15
 - (D) 14

7. Newton Raphson method fails when :
- (A) $f'(x)$ is negative
 - (B) $f'(x)$ is too large
 - (C) $f'(x)$ is zero
 - (D) Never fails
8. In Regula-Falsi method, the first approximation is given by :
- (A) $x_1 = \frac{af(b)-bf(a)}{f(b)-f(a)}$
 - (B) $x_1 = \frac{bf(a)-af(b)}{f(a)-f(b)}$
 - (C) $x_1 = \frac{bf(a)+af(b)}{f(a)+f(b)}$
 - (D) $x_1 = \frac{af(a)-bf(b)}{f(a)-f(b)}$
9. Find the root of $x^3 - 9x + 1 = 0$ for the root lying between 2 and 4 by Regula-Falsi method upto second approximation :
- (A) 2.861
 - (B) 2.740
 - (C) 2.911
 - (D) 2.474
10. Regula-Falsi method is also known as :
- (A) Method of linear interpolation
 - (B) Tangent approximation method
 - (C) Interval halving method
 - (D) None of above
11. Interval of unit length which contains the root of equation $x^4 - 3x^2 + x - 10 = 0$ is :
- (A) (0, 1)
 - (B) (1, 2)
 - (C) (2, 3)
 - (D) None of above

12. Newton-Raphson Iterative formula to find inverse of a is :
- (A) $x_{n+1} = x_n(2 + ax_n)$
 - (B) $x_{n+1} = x_n(2 - ax_n)$
 - (C) $x_{n+1} = x_n(3 - ax_n)$
 - (D) None of above
13. Bisection method is also known as :
- (A) Interval halving method
 - (B) Secant method
 - (C) Newton's method
 - (D) None of above
14. Using Newton's Iterative method find first approximation x_1 of $x \sin x + \cos x = 0$, where $x_0 = \pi$:
- (A) $x_1 = 1.2345$
 - (B) $x_1 = 3.5782$
 - (C) $x_1 = 2.8233$
 - (D) None of above
15. How many steps does the fourth order Runge - Kutta method use :
- (A) Two steps
 - (B) Five steps
 - (C) Four steps
 - (D) Three steps
16. The value of $E^{-1}(f(x))$ is :
- (A) $f(x + h)$
 - (B) $f(x - 2h)$
 - (C) $f(x - h)$
 - (D) None of above

17. Find $f(10)$ by Lagrange formula :

x: 5 6 9 11

f(x): 12 13 14 16

(A) 12.67

(B) 13.67

(C) 14.67

(D) 15.67

18. In which of the following methods proper choice of initial value is very important for :

(A) Bisection method

(B) Newton Raphson method

(C) False-Position method

(D) Least square method

19. Newton-Raphson method is applicable to the solution of :

(A) Both algebraic and transcendental equation

(B) Algebraic only

(C) Transcendental only

(D) None of above

20. Using bisection method, negative root of $x^3 - 4x + 9 = 0$, correct to 3 decimal places is :

(A) -2.506

(B) -2.706

(C) -2.406

(D) None of above

21. The approximation to a root of the equation $x^2 + x - 1 = 0$ in the interval (0, 1) by applying method of false position one time, will be :

(A) 0.75

(B) 0.5

(C) 0.25

(D) 0.65

22. The order of convergence of Newton-Raphson method is :
- (A) 2
 - (B) 3
 - (C) 0
 - (D) 1
23. Possible root of $f(x) = 0$ lies in the interval (a, b) iff $f(x)$ is continuous in $[a, b]$ and:
- (A) $f(a)f(b) < 0$
 - (B) $f(a)f(b) = 0$
 - (C) $f(a)f(b) > 0$
 - (D) None of above
24. Gauss-Elimination is also known as :
- (A) Backward elimination
 - (B) Forward elimination
 - (C) Iterative method
 - (D) None of above
25. In Gauss-Elimination method, coefficient matrix reduces to :
- (A) Lower triangular
 - (B) Diagonal
 - (C) Upper triangular
 - (D) Identity matrix
26. By solving Gauss Elimination method solution of system :
- $$\begin{aligned}x - y + 3z &= 13 \\4x - 2y + z &= 15 \\-3x - y + 4z &= 18\end{aligned}$$
- (A) 2, 2, 3
 - (B) 2, 1, 3
 - (C) -2, 2, 3
 - (D) 2, -2, 3

27. Gauss-Elimination method is :
- (A) Indirect method
 - (B) Direct method
 - (C) Both (A) and (B)
 - (D) None of above
28. Gauss-Seidel method is :
- (A) Direct method
 - (B) Iterative method
 - (C) Both (A) and (B)
 - (D) None of above
29. Considering 4 subintervals $\int_0^1 \frac{1}{1+x} dx$ by trapezoidal rule is :
- (A) 0.6950
 - (B) 0.8725
 - (C) 0.6270
 - (D) 0.3597
30. Formula-
- $$\int_{x_0}^{x_n} y \, dx = \frac{h}{3} [(y_0 + y_n) + 4(y_1 + y_3 + y_5 + \dots) + 2(y_2 + y_4 + y_6 + \dots)]$$
- is :
- (A) Simpson's $\frac{3}{8}$ rule
 - (B) Trapezoidal rule
 - (C) Simpson's $\frac{1}{3}$ rule
 - (D) Weddle's rule
31. In evaluation of $\int_a^b f(x) \, dx$, n is no of subinterval then h is :
- (A) $\frac{b-a}{n}$
 - (B) $\frac{b+a}{n}$
 - (C) $\frac{a-b}{n}$
 - (D) $\frac{b-a}{2n}$

32. In Simpson's $\frac{3}{8}$ rule n (no of subintervals) is :
- (A) Multiple of 1
 - (B) Multiple of 2
 - (C) Multiple of 3
 - (D) Multiple of 4
33. Which formula is obtained by putting $n = 1$ in general quadrature formula ?
- (A) Simpson's $\frac{1}{3}$ rule
 - (B) Simpson's $\frac{3}{8}$ rule
 - (C) Trapezoidal rule
 - (D) Weddle's rule
34. Consider the data :
- | | | | |
|---------|---|---|----|
| $x:$ | 0 | 1 | 2 |
| $f(x):$ | 4 | 3 | 12 |
- Value of $\int_0^2 f(x) dx$ by trapezoidal rule is :
- (A) 11
 - (B) 12
 - (C) 15
 - (D) 9
35. Which of the following is not a central difference formula :
- (A) Newton divided difference formula
 - (B) Sterling for formula
 - (C) Bessel's formula
 - (D) Gauss difference interpolation formula

36. In finite difference E^{-1} is :
- (A) $1 + \nabla$
 - (B) $1 - \nabla$
 - (C) $\nabla - 1$
 - (D) $\nabla + 1$
37. Third Divided difference with argument 2, 4, 9, 10 of $f(x) = x^3 - 2x$ is :
- (A) 2
 - (B) 1
 - (C) -1
 - (D) -2
38. Newton Divided differences are :
- (A) Symmetrical in their arguments
 - (B) Not symmetrical in their arguments
 - (C) Always constant
 - (D) None of above
39. If E is shifting operator and D is differential operator then :
- (A) $E = e^{hD}$
 - (B) $D = \frac{1}{h} \log E$
 - (C) Both (A) and (B)
 - (D) None of above
40. In case of Newton-Gregory Backward interpolation formula if x_0 is initial argument, then end argument x_n is :
- (A) $x_0 + (n - 1)h$
 - (B) $x_0 - nh$
 - (C) $x_0 + nh$
 - (D) $x_0 + (n + 1)h$

41. Given data

x:	0	1	2	3
f(x):	1	2	1	10

Using Newton-Gregory Forward difference interpolation, if $x = x_0 + uh$ then u is :

(A) $\frac{x}{2}$

(B) 1

(C) 1.5

(D) x

42. Newton Gregory Forward interpolation formula is used for the data given :

(A) Equal interval

(B) Unequal interval

(C) Both (A) and (B)

(D) None of above

43. For $(n+1)$ data points, degree of interpolating polynomial is :

(A) At most n

(B) At least n

(C) Exactly n

(D) None of above

44. For given data

x:	0	1	2	3
f(x):	1	2	1	10

then $\Delta^3 f(0)$ is :

(A) 11

(B) 12

(C) -12

(D) None of above

45. Lagrange's Interpolation formula can be used for :

(A) Only equispaced data

(B) Only unequispaced data

(C) Equispaced as well as unequispaced

(D) None of above

46. Missing value of following data :

x:	1	2	3	4	5
f(x):	7	-	13	21	37

is :

- (A) 8.5
- (B) 7.5
- (C) 9.5
- (D) None of above

47. If $f(x) = C$ (Constant) then $\Delta f(x)$ is :

- (A) 0
- (B) C
- (C) 1
- (D) None of above

48. Which of the following is correct ?

- (A) $E \equiv 1 - \Delta$
- (B) $S \equiv E^{1/2} + E^{-1/2}$
- (C) $E \equiv e^{hD}$
- (D) None of these

49. Forward difference $\Delta f(x)$ is :

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

50. Process of finding the value of y corresponding to any value of $x = x_i$ between x_0 and x_n is :

- (A) Extrapolation
- (B) Interpolation
- (C) Polation
- (D) None of above

51. Value of x, y, z in system of :
 $2x + y - 3z = -10$
 $-2y + z = -2$
 $z = 6$
is :
(A) 2, 4, 5
(B) 3, 4, 5
(C) 2, 4, 6
(D) 3, 4, 2
52. Which of the following is not an iterative method ?
(A) Gauss Elimination method
(B) Gauss-Seidal method
(C) Newton-Raphson method
(D) Picard's method of integration
53. Numerical techniques more communally involve :
(A) Direct method
(B) Reduction method
(C) Elimination method
(D) Iterative method
54. First order divided difference $f[x_0, x_1]$ is :
(A) $\frac{f(x_1) - f(x_0)}{x_1 + x_0}$
(B) $\frac{f(x_1) + f(x_0)}{x_1 + x_0}$
(C) $\frac{f(x_1) - f(x_0)}{x_1 - x_0}$
(D) None of above
55. In Gauss-Elimination original equations are transformed by using :
(A) Column operations
(B) Row operations
(C) Mathematical operations
(D) Subset

56. Simpson's formula is applicable to :
- (A) Odd number of intervals
 - (B) Even number of intervals
 - (C) Odd or even number intervals
 - (D) None of above
57. If $x_0 = 0.75825$
 $x = 0.759$
 $h = 0.00005$
then u is :
- (A) 1.5
 - (B) 15
 - (C) 2.5
 - (D) 25
58. Which of the following is strictly diagonally dominant matrix ?
- (A) $\begin{bmatrix} 2 & 1 \\ 3 & 7 \end{bmatrix}$
 - (B) $\begin{bmatrix} 3 & 2 \\ 2 & 4 \end{bmatrix}$
 - (C) (A) and (B) both
 - (D) None
59. While finding (+ve) root of $(17)^{1/3}$ correct to six decimal places by Newton-Raphson method, $f(x)$ is :
- (A) $f(x) = x^3 + 17$
 - (B) $f(x) = x^3 - 17$
 - (C) $f(x) = x - (17)^{1/3}$
 - (D) None of above
60. Bisection method is :
- (A) Always convergent
 - (B) Never convergent
 - (C) Quadratically convergent
 - (D) None of above

61. Given $\frac{dy}{dx} = x^2 - y$, $y(0) = 1$ if table of iterations is :

x:	0	0.1	0.2
y:	1	0.91	0.82

then step size h is :

- (A) 0
- (B) 1
- (C) 0.01
- (D) 0.1

62. Consider $\frac{dy}{dx} = x - y$
 $y(0) = 1$;

using Picard's method, first approximation y_1 is :

- (A) $y_1 = 1 + x + \frac{x^2}{2}$
- (B) $y_1 = 1 + x - \frac{x^2}{2}$
- (C) $y_1 = 1 - x + \frac{x^2}{2}$
- (D) $y_1 = 1 - x + \frac{x^2}{2}$

63. Runge-Kutta method is also called :

- (A) Step by step method
- (B) Series method
- (C) Direct method
- (D) None

64. Given data :

x:	x_0	x_1	x_2	x_3
f(x):	$f(x_0)$	$f(x_1)$	$f(x_2)$	$f(x_3)$

then Simpson's $\frac{3}{8}$ rule is :

- (A) $\frac{3h}{8} [f(x_0) + f(x_3) + 2\{f(x_1) + f(x_2) + f(x_3)\}]$
- (B) $\frac{3h}{8} [f(x_0) + 2f(x_1) + 2f(x_2) + 2f(x_3)]$
- (C) $\frac{3h}{8} [f(x_0) + f(x_3) + 2f(x_1) + 2f(x_2)]$
- (D) None of above

65. $(1 + \Delta)(1 - \nabla)$ is :
- (A) -1
- (B) Δ
- (C) 1
- (D) E
66. Applying Gauss-Seidel iteration method to solve :
- $$20x + y - 2z = 10$$
- $$3x + 20y - z = -18$$
- $$2x - 3y + 20z = 25$$
- (A) $x = 1, y = 1, z = 1$
- (B) $x = 1, y = -1, z = 1$
- (C) $x = 2, y = 1, z = 0$
- (D) $x = 1, y = 1, z = -1$
67. Given $\frac{dy}{dx} = y - x^2 + 1, (h = 0.5) y(0) = 0.5$, using Runge-Kutta method of IV order, value of K_1 is :
- (A) 0.7
- (B) 0.65
- (C) 0.75
- (D) 0.85
68. For $\frac{dy}{dx} = f(x, y), y(x_0) = y_0$, Picard's method successive approximation formula is:
- (A) $y_{n+1} = y_n + \int_{x_0}^x f(x, y_n) dx$
- (B) $y_{n+1} = y_n + \int_{x_0}^x f(x_n, y_n) dx$
- (C) $y_{n+1} = y_0 + \int_{x_0}^x f(x, y_n) dx$
- (D) None of above

69. Given problem $\frac{dy}{dx} = f(x, y)$, $y(x_0) = y_0$ is known as :
- (A) Boundary value problem
 - (B) Initial value problem
 - (C) Both (A) and (B)
 - (D) None of above
70. If $(n+1)$ data points are given then $\Delta^n f(x)$ is :
- (A) 0
 - (B) 1
 - (C) 2
 - (D) n_0^1
71. Solution of system :
- $$2x - 3y + 10z = 3$$
- $$-x + 4y + 2z = 20$$
- $$5x + 2y + z = -12$$
- by Gauss Elimination method is :
- (A) 4, 3, 2
 - (B) 4, -3, 2
 - (C) -4, -3, 2
 - (D) -4, 3, 2
72. Which of the following formula is not used in interpolation ?
- (A) Lagrange's formula
 - (B) Newton's-Gregory Forward formula
 - (C) Central difference formula
 - (D) Taylor's formula
73. Simpson's $\frac{3}{8}$ rule gives best approximation if :
- (A) $f(x) = ax + b$
 - (B) $f(x) = ax^2 + bx + c$
 - (C) $f(x) = ax^3 + bx^2 + cx + d$
 - (D) None of above

74. If $f(0) = 1$ and $f(1) = 2.72$, then approximate value of $\int_0^1 f(x) dx$ by Trapezoidal rule is :
- (A) 3.72
 - (B) 1.024
 - (C) 0.024
 - (D) 1.86
75. Using Gauss-Seidel method, I approximation of system $x - 2y = 1$ and $x + 4y = 4$ is :
- (A) $x = 1, y = 0.75$
 - (B) $x = 0.25, y = 1$
 - (C) $x = 0, y = 0$
 - (D) $x = 1, y = 0.65$
76. Which of the following system is diagonally dominant ?
- (A) $3x + y = 1$
 $x + 5y = 4$
 - (B) $2x + 7y = 1$
 $x + y = -3$
 - (C) Both (A) and (B)
 - (D) None of above
77. The condition that gives guarantee for convergence of Gauss-Seidel method is known as :
- (A) Diagonally dominant
 - (B) Off diagonal dominant
 - (C) Diagonal pivoting
 - (D) Partial pivoting

78. In which of the following methods both sides of equation are multiplied by non zero constant ?
- (A) Gauss Elimination method
 - (B) Gaussian Quadrature method
 - (C) Gaussian consistent procedure
 - (D) None of these
79. Gauss-Seidel method can be used for solving a set of :
- (A) Linear algebraic equations only
 - (B) Linear differential equations only
 - (C) Both linear and non-linear equations only
 - (D) None of these
80. Newton's divided difference polynomial which interpolate the data $f(0) = 1$, $f(1) = 3$, $f(3) = 55$ is :
- (A) $8x^2 + 6x + 1$
 - (B) $8x^2 - 6x + 1$
 - (C) $8x^2 - 6x - 1$
 - (D) $8x^2 + 6x - 1$
81. In general quadrature formula to evaluate $\int_a^b f(x)dx$, $f(x)$ is approximated by :
- (A) Least square approximation
 - (B) Newton's Gregory Forward Interpolation
 - (C) Hermite Interpolation
 - (D) None of these
82. If $\int_0^1 \frac{1}{1+x^2} dx = 0.7854$ by Simpson's $\frac{1}{3}$ rule and $\int_0^1 \frac{1}{1+x^2} dx = 0.7853$ by exact method, then error is :
- (A) 0.0001
 - (B) 0.00001
 - (C) 0.001
 - (D) 0.1

83. In Simpson's $\frac{1}{3}$ rule, curve $y = f(x)$ is assumed to be a :

- (A) Circle
- (B) Parabola
- (C) Hyperbola
- (D) None of these

84. For given data-

x:	0	$\frac{1}{6}$	$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	1
y:	1	0.97	0.90	0.80	0.62	0.59	0.50

h is :

- (A) 1
- (B) $\frac{1}{6}$
- (C) $\frac{2}{6}$
- (D) $\frac{3}{6}$

85. Which of the following is equivalent to $\Delta \log(f(x))$?

- (A) $\log \left[\frac{\Delta f(x)}{f(x)} \right]$
- (B) $\log \left[\frac{E f(x)}{f(x)} \right]$
- (C) $\log \left[1 - \frac{\Delta f(x)}{f(x)} \right]$
- (D) $\log \left[1 + \frac{\Delta f(x)}{f(x)} \right]$

86. The convergence of which of the following method is sensitive to initial approximation :

- (A) Regula-Falsi method
- (B) Gauss-Seidal method
- (C) Newton-Raphson method
- (D) All of above

87. Value of $\frac{\Delta^2}{E}(x^3)$ is :
- (A) $6x$
 - (B) $2x$
 - (C) $3x$
 - (D) None of these
88. The order of convergence of Regula-Falsi method is :
- (A) 2
 - (B) 1.172
 - (C) 1.618
 - (D) 1.17
89. The value of $\Delta^n(a^x)$ is :
- (A) $(a^h + 1)^n a^x$
 - (B) $(a^h - 1)^n a^x$
 - (C) $(a^{nh} - 1) a^x$
 - (D) $(a^{nh} + 1) a^x$
90. Numerical differentiation is a method of finding :
- (A) Approximation value of differential
 - (B) Exact value of differential
 - (C) Both (A) and (B)
 - (D) None of these
91. Using Newton-Raphson method, 1st approximation of $x^3 + 4x + 1 = 0$, with $x_0 = 1$, is :
- (A) 1.67
 - (B) 1.87
 - (C) 1.86
 - (D) None of above

92. Simpson's $\frac{1}{3}$ rule gives exact value of $\int_a^b f(x) dx$ if $f(x)$ is :
- (A) Linear polynomial
 - (B) Quadratic polynomial
 - (C) Cubic polynomial
 - (D) Biquadratic polynomial
93. For given ODE $\frac{dy}{dx} = x + y$, $y(0) = 1$, using Euler's method, ($h = 0.2$) value of $y(0.2)$ is :
- (A) 1
 - (B) 2
 - (C) 1.2
 - (D) 1.23
94. In Runge-Kutta method of fourth order, Δy is :
- (A) $\frac{1}{5}(K_1 + 2K_2 + 2K_3 + K_4)$
 - (B) $\frac{1}{6}(K_1 + 2K_2 + 2K_3 + K_4)$
 - (C) $\frac{1}{6}(K_1 + K_2 + K_3 + K_4)$
 - (D) $\frac{1}{6}(K_1 + 2K_2 + K_3 + K_4)$
95. For given data-
- | | | | |
|-------|---|---|---|
| x: | 1 | 2 | 3 |
| f(x): | 1 | 4 | 9 |
- Find $f^1(x)$ at $x = 1$
- (A) 2
 - (B) 3
 - (C) 1
 - (D) 0

96. Bisection method is based on :
- (A) Bolzano's theorem
 - (B) Taylor's theorem
 - (C) Maclaurin's theorem
 - (D) None of above
97. Trapezoidal rule gives exact value of integration of integrand is :
- (A) Linear polynomial
 - (B) Quadratic polynomial
 - (C) Cubic polynomial
 - (D) Biquadratic polynomial
98. Picard's method is used for finding the numerical solutions of :
- (A) Linear differential equations
 - (B) Non linear differential equations
 - (C) Both (A) and (B)
 - (D) None of above
99. Which of the following method is quadratically convergent ?
- (A) Bisection method
 - (B) Regula-Falsi method
 - (C) Newton-Raphson method
 - (D) Secant method
100. Bessel's formula is derived by mean of :
- (A) Gauss Forward and Gauss Backward
 - (B) Gauss Backward and Gauss third
 - (C) Gauss Forward and Gauss third
 - (D) Sterling and Gauss Forward

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