18U203 (Pages: 2) Name………………………

Reg. No……………………

SECOND SEMESTER B.C.A. DEGREE EXAMINATION, APRIL 2019
(CUCBCSS – UG)
CC15U BCA2 C04 – NUMERICAL METHODS IN C
Complementary course
(2015, 2016 Admissions Supplementary)

Time: Three Hours   Maximum: 80 Marks

Part A
Answer *all* questions. Each question carries 1 mark.

1. An equation f (x) = 0 which is not algebraic is called ……..……
2. Write the formula for solving an equation using Newton Raphson method.
3. Write the formula for Simpson's 3/8th rule.
4. If f(x) = x^2 +1 , find $\Delta f(x)$ with interval difference 1
5. E (f (x)) = ……..……
6. Write the formula for solving a linear system of equations using Cramer's rule
7. Write Newton's interpolation formula.
8. The numbers in the computer can be stored in two forms. Which are they?
9. $\nabla f(x) =$ ……..……
10. Write the Trapezoidal rule of integration.

(10 x 1 = 10 Marks)

Part B
Answer all *five* questions. Each question carries 2 marks.

11. Find a real root of x^3 – x +1 =0 using Bisection method.
12. Set up a procedure for finding the root of 2 using Newton Raphson method.
13. Show that E = e^{hD}
14. Find $\int_0^2 x \, dx$ using Trapezoidal rule taking h = 0.5
15. Solve f(x, y) = x + y with y (0) = 1 to find y(1), taking h = 0.5 using Euler's method.

(5 x 2 = 10 Marks)

Part C
Answer any *five* questions. Each question carries 4 marks.

16. Find a real root of x^3 + x^2 -1 = 0 using in [0, 1] using method of false position.
17. Find a real root of x^3 – 2x + 5 = 0 using Newton – Raphson method.
18. Solve using Cramer's rule.

$$x + y + z = 9; \; 2x - 3y + 4z = 13; \; 3x + 4y + 5z = 40$$

19. Explain Gauss – Jordan method for solving a linear system of equations.

20. Find the missing term in the table

x	0	1	2	3	4
y	1	3	9	-	81

21. Prove that $\mu = \sqrt{\left(1 + \frac{1}{4}\delta^2\right)}$

22. Using Simpson's 1/3rd rule evaluate $\int_0^1 \frac{1}{x} dx$

23. Using Lagrange interpolation formula find y(x) as a polynomial.

x	0	1	3	4
y	- 12	0	12	24

(5 x 4 = 20 Marks)

Part D

Answer any *five* questions. Each question carries 8 marks.

24. Solve $2x + y + z = 10$; $3x + 2y + 3z = 18$; $x + 4y + 9z = 1$ using Gauss Elimination method.

25. Find the inverse of the matrix $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$ using Gauss Jordan method.

26. Using the following table find f(x) as a polynomial in x

x	-1	0	3	6	7
f(x)	3	-6	39	822	1611

27. Find the first two derivatives of f(x) at x = 15 from the following table.

x	50	51	52	53	54	55	56
y	3.68	3.70	3.73	3.75	3.77	3.80	3.82

28. Solve $\frac{dy}{dx} = x - y$, y (0) = 2; Find y(0.1) and y (0.2) using R - K method of order 4

29. Solve $\frac{dy}{dx} = -y$ with y(0) = 1. Using Euler's modified method compute y (0.01), y (0.02), y (0.03) and y(0.04)

30. Solve by triangularization method

$$2x + 3y + z = 9 \; ; \; x + 2y + 3z = 6 \; ; \; 3x + y + 2z = 8$$

31. By Gaussian Quadrature formulae evaluate $\int_2^3 \frac{dt}{1+t}$

(5 x 8 = 40 Marks)

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