



K18U 1006

Reg. No. : .....

Name : .....

IV Semester B.C.A. Degree (CBCSS-Reg./Sup./Imp.) Examination, May 2018  
(2014 Admn. Onwards)  
General Course  
4A14BCA : NUMERICAL ANALYSIS

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. **One** word answer : (8×0.5=4)
- a) A matrix A is said to be non-singular if  $|A|$
  - b) \_\_\_\_\_ errors are those that are present in the data supplied to the model.
  - c) Convert binary number 1101.1101 to decimal equivalent.
  - d) An edge that connects a vertex to it self is
  - e) A connected a cyclic graph is called
  - f) A system of equations  $A X = B$  is consistent if
  - g) Numerical quadrature is also known as
  - h) Data that are obtained by counting are called

SECTION – B

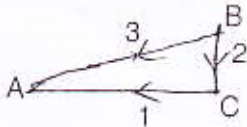
Answer **any 7** questions : (7×2=14)

- 2. Convert the hexa decimal number 39.138 to an octal number.
- 3. Estimate the possible initial guess values of the polynomial equation  $2x^3 - 8x^2 + 2x + 12 = 0$ .
- 4. Solve the system of equations  $3x + 4y = 7$ ,  $5x + 3y = 8$ .
- 5. Solve  $y' = x + 2y$ ,  $y(0) = 1$ , using Eulers method for  $x = 0.2$ , taking  $h = 0.1$ .

P.T.O.



6. Define isomorphism of graphs with an example.
7. Evaluate  $\int_1^2 x^2 dx$  by using trapezoidal rule with  $n = 4$ .
8. Estimate appropriate derivative of  $f(x) = x^2$  at  $x = 1$ , for  $h = 0.1$  and  $0.01$  using first order forward difference formula.
9. Find the inverse of the matrix  $A = \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$ .
10. Find the truncation error in the function  $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \frac{x^6}{6!}$  for  $x = \frac{1}{5}$  when we use first three terms.
11. Write down the complete incidence matrix of the closed path ABC of the graph



## SECTION - C

Answer any 4.

(4×3=12)

12. Find the root of the equation  $f(x) = x^2 - 3x + 2$  in the vicinity of  $x = 0$  using Newton-Raphson method.
13. Explain connectives.
14. Using Taylor series method solve  $y' + 0.1y = 0$ ,  $y(0) = 2$  for  $y(0.1)$  with  $h = 0.1$ .
15. Use Simpson's Rule with  $n = 4$  to estimate  $\int_0^2 \frac{1}{1+x} dx$ .
16. Use the false position method to find a root of the function  $f(x) = x^2 - x - 2 = 0$  in  $1 < x < 3$ .
17. Find a root of the equation  $x^2 - 4x - 10 = 0$  by using bisection method.



SECTION – D

Answer **any 2** questions :

(2×5=10)

Write an essay on **any two** of the following questions.

18. Apply Runge-Kutta method to solve the IVP,  $y' = x + y$ ,  $y(0) = 0$ , choosing  $h = 0.2$  and compute  $y_1, y_2, y_3, y_4$  and  $y_5$ :

19. Use Guass-Jordan method to solve the system of equations

$$2x + 4y - 6z = -8;$$

$$x + 3y + z = 10;$$

$$2x - 4y - 2z = -12$$

20. Find  $f(2.5)$  from the following table by using Langrange interpolation polynomial

<b>x</b>	1	2	3	4	5
<b>f(x)</b>	1	1.4142	1.7321	2	2.2361

21. Explain any one iteration method for solving linear equations.

---