

TB156280A

Reg. No.....

Name.....

B. Sc. DEGREE (C.B.C.S.S) EXAMINATION, MARCH 2018

SEMESTER VI – CORE (COMPUTER APPLICATIONS [TRIPLE MAIN])

**CAS6B06TB - NUMERICAL METHODS AND INTRODUCTION TO
R PROGRAMMING.**

Time: Three Hours

Maximum Marks : 80

Part A

I. Answer all questions. Each question carries 1 mark.

1. What is the difference between algebraic and transcendental equations?
2. What are Cote's Numbers?
3. Why Trapezoidal rule is called so?
4. Define the order of the random number generator.
5. Define the term Pseudo randomness
6. What is the use of ls() function? (6X1=6)

Part B

II. Answer any seven questions. Each question carries 2 marks.

7. Give the Graphical representation of Bisection method.
8. Briefly explain how to insert a Matrix in R programming
9. By Gaussian Elimination method ,Solve $x + y = 2$ and $2x + 3y = 5$
10. Explain the term Complete pivoting
11. What are the advantages of Newton's formula over Lagrange's formula ?
12. If $f(x) = 0$ has root between $x = a$ and $x = b$.then write the first approximate root by the method of false position.
13. What are quasi random numbers?
14. What is inverse transform method?
15. What are the errors in Trapezoidal rule of numerical integration?
16. Mention the use of array() function. (7X2=14)

Part C

III. Answer any five questions. Each question carries 6 marks.

17. Briefly explain Jacobi's method for solving a system of simultaneous equations.
18. Decompose the following matrix

$$A = \begin{bmatrix} 5 & -2 & 1 \\ 7 & 1 & -5 \\ 3 & 7 & 4 \end{bmatrix}$$

19. Solve the following system of equations

$$10x - y + z = 12$$

$$2x + 10y + z = 13$$

$$x + y + 3z = 5$$

20. Explain different loop control statements in R.
21. Write the algorithm of Acceptance/Rejection method to generate Uniform random deviates.
22. Explain briefly the limitations of Random number Generators.
23. Describe how to get Scatter Plot in R.
24. Obtain Generalized Quadrature formula. **(5X6=30)**

Part D

IV. Answer any two questions. Each question carries 15 marks

25. Compute, to four decimal places, the root between 1 and 2 of the equation
$$x^3 - 2x^2 + 3x - 5 = 0$$

by (a) Method of false position (b) Newton Raphson Method
26. Derive Newton forward interpolation formula and hence obtain the Trapezoidal rule for numerical integration.
27. Explain the Box-Muller method for generating Normally distributed random deviates.
28. Explain different R objects available in R .

(2X15=30)