K16U 0674

Reg. No. : .....

Name : .....

IV Semester B.C.A. Degree (CBCSS – 2014 Admn.-Regular) Examination, May 2016

General Course

4A14BCA : NUMERICAL ANALYSIS

Time : 3 Hours Max. Marks : 40

SECTION – A

1. Answer **all** the questions. **Each** question carries ½ mark. **(8×0.5=4 Marks)**
   a) Data that are obtained by counting are called
   b) The conjunction of two statements P and Q is
   c) Radix point is
   d) The binary equivalent of decimal 25 is
   e) In a graph a node which is not adjacent to any other node is called
   f) The iterative method in which the fastest convergence is
   g) A product of the variables and their negations in a formula is called
   h) Any graph which contains some parallel edges is called

SECTION – B

Write short notes on **any seven** of the following : **(7×2=14 Marks)**

2. Construct the truth table for the statement formula $(P \vee Q) \vee \neg P$.
3. Define a graph G.
4. How floating point numbers are stored in memory of a computer ?

P.T.O.

5. Determine the roots of the equation

   $x^2 + xy = 6$

   $x^2 - y^2 = 3$ Using Newton-Raphson method

6. Define tautology.

7. Form the conjunction of P : It is raining today, Q : There are 20 tables in the room.

8. Differentiate between round off error and truncation error.

9. Define simple graph, multigraph and weighted graph.

10. Define a list in the context of list processing.

11. Define Lagrange's interpolation method.

SECTION – C

Answer **any four** of the following questions : **(4x3=12 Marks)**

12. Explain negation, conjunction and disjunction with suitable examples.

13. Define a statement formula. What are the rules for generating a well formed formula ?

14. Differentiate between conjunctive normal forms and disjunctive normal forms.

15. Explain about list structures.

16. From the following table of values of x and y, find $\frac{dy}{dx}$ at $x = 2$ using the cubic spline method.

X	2	3	4
Y	11	49	123

17. Find $I = \int_0^1 x dx$ by Gauss Formula.

SECTION – D

Write an essay on **any two** of the following : **(2×5=10 Marks)**

18. Using Eulers method, solve $\frac{dy}{dx}=\frac{x-y}{x+y}$ $y(0) = 1$, in the range $0 \leq x \leq 0.1$ taking $h = 0.02$.

19. Compute the values of $I=\int_0^1 \frac{dx}{1+x^2}$ by using Trapezoidal rule with $h = 0.5, 0.25$ and 0.125. Obtain a better estimate by using Romberg's method. Compare the result with true value.

20. Solve the system of linear equations using Gauss-Jordan

$2x + y + z = 10$

$3x + 2y + 3z = 18$

$x + 4y + 9z = 16$

21. Find the solution to three decimals of the following system using Jacobi's method.

$83x + 11y - 4z = 95$

$7x + 52y + 13z = 104$

$3x + 8y + 29z = 71$