

Paper Code & Roll No. to be filled in your Answer Book

Roll No.

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BCA II Year (Semester-III)

Odd Semester Examination-2015-2016

Computer Based Numerical Techniques

Time : 3 Hours]

[Maximum Marks : 70

UNIT-1

Attempt any TWO questions from this section (2x7=14)

- Q1) Define 'Absolute error' and 'Relative error'. An approximate value of π is given by 3.1428571 and its true value is 3.1415926. Find absolute and relative errors
- Q2) Multiply the following floating point numbers: (i) .1111 E 51 and .4444 E 50 (ii) .1234 E -49 and .1111 E -54
- Q3) In normalized floating point mode, carry out the following mathematical operation: (.4546 E 3) + (.5454 E 8)

UNIT-2

Attempt any TWO questions from this section (2x7=14)

- Q4) The equation $f(x) = 3x^3 + 4x^2 + 4x + 1 = 0$ has a root in interval $[-1, 0]$. Find this root with an accuracy of 10^{-4} using iteration method?
- Q5) Find the rate of convergence of Newton-Raphson method?
- Q6) Write a computer program in 'C' for the Regula-Falsi method?

UNIT-3

Attempt any TWO questions from this section (2x7=14)

- Q7) Prove that the order of convergence of Secant method for finding the roots of equation is 1.62.
- Q8) Derive the Gauss Legendre 2-point formula?
- Q9) Solve $10x - 7y + 3z + 5u = 6$, $-6x + 8y - z - 4u = 5$, $3x + y + 4y + 11u = 2$ and $5x - 9y - 2z + 4u = 7$ by Gauss Elimination method.

UNIT-4

Attempt any TWO questions from this section (2x7=14)

- Q10) Discuss the Newton's forward and backward formula with example?
- Q11) Use Newton's divided difference formula to find $f(7)$ if $f(3) = 24$, $f(5) = 120$, $f(8) = 504$, $f(9) = 720$, and $f(12) = 1716$?
- Q12) Prove that the n th differences of a polynomial of n th degree is constant and all higher order differences are zero?

UNIT-5

Attempt any TWO questions from this section (2x7=14)

- Q13) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Simpson's 1/3 rule?
- Q14) Describe the Euler's method for solving the differential equations?
- Q15) Write an algorithm for solving differential equation using 4th order Runge-Kutta method?