

**NUMERICAL METHODS AND C – PROGRAMMING**

(In the first two units the value of a root may be calculated upto 3 decimal accuracy only)

**Unit I**

Algebraic & Transcendental equations – Finding a root of the given equation (Deviation of the formula not needed) using Bisection method, method of False position, Newton – Raphson method. Finite differences – Forward, Backward – Newton’s forward & backward difference interpolation formulae – Interpolation with unevenly spaced intervals – Application of Lagrange’s interpolating polynomial (proof not needed) – Divided differences and their properties – Applications of Newton’s General Interpolating formula (proof not needed) – only problems.

**Unit II**

Numerical differentiation – Newton’s forward, backward method to compute first and second derivative  
Numerical integration using Trapezoidal rule – Simpson’s 1/3<sup>rd</sup> rule – Theory and problems

**UNIT III**

Constants ,Variables, data types symbolic constants –Operators & expressions – evaluation of Expressions –reading & writing a character –Formatted input & output.

**UNIT II**

Decision making and branching – Use of IF , IF-ELSE ,& nesting of IF-ELSE statements – ELSE – IF ladder – Switch statement – Conditional Operator – GOTO statement – Decision making & looping – WHILE , DO , and FOR statements.

**UNIT III**

Arrays – One dimensional ,two dimensional & multi dimensional groups – Structures – Initialization - comparison –Arrays of structures –Arrays within structures – structures within structures and functions.

**Text Book:**

1. S.S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India Pvt., Limited, 1995  
Unit I – Chapters 2 & 3 (relevant sections only)  
Unit II – Chapter – 4 (relevant sections only)

2. E.Balagurusamy , Programming in ANCI C, Tata McGraw Hill Publishing Company Ltd, 2002 (5<sup>th</sup> Reprint)
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| UNIT – III | - | Chapters 2,3 & 4 |
| UNIT – IV  | - | Chapters 5 & 6   |
| UNIT – V   | - | Chapters 7 & 10  |

**Reference (s):**

- 1) S. Narayanan and others, Numerical analysis, S. Viswanathan Publishers, 1994
- 2) A. Singaravelu, Numerical methods, Meenachi Agency, June 2000
- 3) Rajaraman, V, Programming in C, Prentice Hall of India, 2000
- 4) Yeshwant Kanetkar, Let us C, BPB Publications, 2000
- 5) B.S. Gottfried, Programming with C, Schaym's Series, Tata McGraw Hill, 1996.
- 6) Manish Jain, Let us C, BPB Publications, New Delhi, Third Revised Edn., 1999.