

7. Explain in detail Chebyshev polynomials. 14

Unit IV

8. Find integral of $f(x)$ for the following points using Simpson's rule and trapezoidal rule : 14

0.1	1.01
0.2	1.04
0.3	1.09
0.4	1.16
0.5	1.25
0.6	1.36
0.7	1.49
0.8	1.64
0.9	1.81

8. Write short notes on the following : $2 \times 7 = 14$

- (a) Gaussian Quadrature
- (b) Polynomial fit.

Roll No.

Exam Code : M-21

Subject Code—52851

B.C.A. EXAMINATION

(Main/Re-appear)

(Batch 2017 Onwards)

(First Semester)

COMPUTER ORIENTED NUMERICAL
METHODS

BCA-113

Time : 3 Hours

Maximum Marks : 70

Note : Q. No. 1 is compulsory. Attempt any other *Four* questions in all, selecting *one* question from each Unit. All questions carry equal marks.

1. (a) What are ill conditioned equations ?

7×2=14

(b) Why are floating point numbers normalized ?

- (c) Define approximation.
- (d) What are the pitfalls in differentiation ?
- (e) Add .1239E99 and .1345E99.
- (f) Explain pivoting.
- (g) What is the use of difference tables ?

Unit I

2. (a) What is normalized floating point representation ? Express the following in normalized floating point representation :
 - (i) 0.0012342
 - (ii) -12.893. 7
- (b) Explain different types of errors in number representation. 7
3. (a) Find the real roots of the equation $x = e^{-x}$, using Newton-Raphson method correct to 4 decimal places. 10
- (b) Explain Bairstow's method. 4

Unit II

4. (a) How to solve a set of simultaneous linear equations using Gauss elimination method with pivoting ? Explain with the help of an example. 10
- (b) What are predictor methods ? 4
5. Discuss Runge-Kutta methods. Solve the following differential equation using Runge-Kutta methods :

$$\frac{dy}{dx} = 3x + y \text{ for } 0.1 \leq x \leq 0.5 \text{ and given}$$

that $y = 0$ when $x = 0$ and $h = 0.1$. 14

Unit III

6. (a) How to approximate a function using Taylor series representation ? Give example. 7
 - (b) Interpolate the value of function corresponding to $x = 4$ using Lagrange's interpolation formula from the following set of data : 7
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|--------|---|----|----|----|----|----|
| x | : | 2 | 3 | 5 | 8 | 12 |
| $f(x)$ | : | 10 | 15 | 25 | 40 | 60 |