

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.

M.Sc. - END SEMESTER EXAMINATIONS APRIL - 2022

SEMESTER - II

20PPHCT2007 - Computational Methods and C Programming

Total Duration : 3 Hrs.

Total Marks : 60

Section A

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. Find the zero of the function $f(x) = x^3 - 2x^2 + x - 3$ with $x_0 = 4$ by Newton Raphson-method up to three iterations.
2. Using Gauss-Jordan method solve $x+y+z = 2$; $x-y+z = 4$; $2x-2y+z = 6$.
3. Fit a straight line for the given data by least square refinement.

x	0.5	1.0	1.5	2.0	2.5	3.0
y	0.31	0.82	1.29	1.85	2.51	3.02

4. Approximate the integral $\int_2^5 \frac{1}{x} dx$ using trapezoidal rule for 6 sub intervals.
5. Explain data-types in C with examples.
6. Find $f(3)$ for the data $f(1)=1$, $f(2)=4$, $f(5)=10$ using Lagrange interpolation.
7. Use Gauss-Jacobi method to find the inverse of the matrix $A = \begin{bmatrix} 1 & 3 \\ 2 & 7 \end{bmatrix}$
8. Explain executable and non-executable statements in C language with example.

Section B

Part A

Answer any **TWO** questions ($2 \times 10 = 20$ Marks)

9. Find the solution that lies between 2 and 3 for, $x \log_{10} x = 1.2$, correct to three decimal places using bisection method.
10. Apply Gauss elimination method to find the solution of the following system.
 $2x + y + z = 7$; $x - y + z = 0$; $4x + 2y - 3z = 4$.
11. Following data gives the temperature in oC between 8.00 AM and 8.00 PM on a particular day in Chennai. Using Newton's backward interpolating formula to compute the temperature in Chennai on that day at 5.00 PM.

Time (Hrs)	8.00	12.00	16.00	20.00
Temp. (°C)	30	37	40	38

Contd...

12. Using Runge - Kutta of fourth order solve, $\frac{dy}{dx} = (x+y) \sin xy$, $y(0) = 5$, at $0 \leq x \leq 2$ with steps $h = 0.2$.

Part B

Compulsory question ($1 \times 10 = 10$ Marks)

13. Write a program in C language for Simpson's rules.
