

2015

MCA

2nd Semester Examination

COMPUTER ORIENTED NUMERICAL METHODS LAB

PAPER—MCA-208

(Practical)

Full Marks : 100

Time : 6 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer any one question (by Lottery basis) 1×60

1. Write a C program to solve $\int_0^2 \frac{1}{1+x+x^2} dx$ using

Simpsons's $\frac{1}{3}$ rule taking 8 intervals.

(Turn Over)

2. Write a C program to evaluate $\int_1^2 \frac{1}{x^2 + 1} dx$ taking $h=0.2$ using trapezoidal rule.

3. Write a C program to find the value $y(2.5)$ from the table

x	1	2	3	4
y	5	9	14	20

Using Newton's Forward difference interpolation formula.

4. Write a C program to find the value of $y(76)$ from the table

x	40	50	60	70	80	90
y	70	20	20	32	36	38

Using Newton's Backward difference interpolation formula.

5. Write a C program to find the root of the equation $x^3 - 3x - 3 = 0$ using bisection method. [Correct upto 3 decimal position.]
6. Write a C program to find the root of the equation $x - \cos x = 0$ using Regula-Falsi method. [Correct upto 3 decimal position.]

7. Write a C program to find the root of $x + \log x = 2$ using Newton-Raphson's method. [Correct upto 3 decimal position.]

8. Write a C program to solve the system of equations

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

$$2x + 3y + 3z = 10$$

$$3x - y + 2z = 13$$

Using Gauss-elimination method.

9. Write a C program to solve the system of equations

$$8x + y + z = 8$$

$$2x + 4y + z = 4$$

$$x + 3y + 3z = 5$$

Using Gauss-Seidel method.

10. Write a C program to find the value of the integral

$$I = \int_0^6 \frac{dx}{1+x^3} \text{ using Weddle's rule with } h=1.$$

11. Write a C program to find the root of the equation

$$x^3 - 3x - 3 = 0 \text{ using Regula-Falsi method. [Correct}$$

upto 3 decimal position.]

12. Write a C program to find the root of the equation $x - \cos x = 0$ using Newton-Raphson method. [Correct upto 3 decimal position.]

13. Write a C program to find the root of the equation $x + \log x = 2$ using bisection method. [Correct upto 3 decimal position.]

14. Write a C program to solve the system of equations

$$x - y + z = 6$$

$$2x + 4y + z = 3$$

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

Using Gauss-Seidel method.

15. Write a C program to solve the system of equations

$$x - y - 3z = 0$$

$$x + 2y - z = -1$$

$$3x - y - 2z = 5$$

Using Gauss-elimination method.

16. Write a C program to find the value of the integral

$$\int_0^2 \frac{1}{1+x+x^2} dx \text{ using Weddles's rule taking } h=0.25.$$

17. Write a C program to find the value of $f(0.23)$ from the following table.

x	0.2	0.22	0.24	0.26	0.28
f(x)	1.6596	1.6698	1.6804	1.6912	1.7024

Using Newton's Forward difference interpolation formula.

18. Write a C program to find the value $f(1.5)$ from the following table

x	1	2	3	4	5	6
f(x)	1	8	27	64	125	216

Using Newton's Forward difference interpolation Formula.

19. Write a C program to find the value of the integral

$$I = \int_0^6 \frac{dx}{1+x^3} \text{ using Simpsons } \frac{1}{3} \text{ rule taking } h=1.$$

20. Write a C program to find the value of the integral $\int_1^2 \frac{1}{x} dx$ using trapezoidal rule taking $h=0.2$.

Viva-Voce — 30

PNB — 10

Marks Distribution

1. Programming — 10%
 2. Storing, execution of the program and results — 20%
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