

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc.,B.A. DEGREE EXAMINATION – MATH.,STAT.,PHY.,COMP.SCIEN.,ECON.

THIRD SEMESTER – NOVEMBER 2009

CS 3203 / 3200 - NUMERICAL METHODS USING C

Date & Time: 13/11/2009 / 9:00 - 12:00 Dept. No.

Max. : 100 Marks

PART A

Answer ALL questions

10 x 2 = 20

1. Define identifier.
2. What is meant by preprocessor directive?
3. How does the break and continue statement differ?
4. Define recursion.
5. Find the determinant of the given matrix. $\begin{bmatrix} 3 & 4 \\ 7 & 2 \end{bmatrix}$
6. Form the characteristic equation of the matrix $\begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}$
7. List the various interpolation methods.
8. State the formulae related to Simpson's $\frac{3}{8}$ and $\frac{1}{3}$ rules.
9. State the formula related to Runge-kutta method of fourth order.
10. What is bisection method?

PART B

Answer ALL questions

5 x 8 = 40

11. (a) Explain the structure of the C program.
(OR)
(b) Classify Operators in C with example.
12. (a) What are the looping statements available in C? Explain any two with example and syntax.
(OR)
(b) Explain the concept of Arrays in C.
13. (a) Write a C program to implement Gauss Elimination method.
(OR)
(b) Find the numerically larger eigen value of the given matrix. $A = \begin{pmatrix} 3 & -5 \\ -2 & 4 \end{pmatrix}$
14. (a) Write a C program to implement Lagrange's formula.
(OR)
(b) Solve $\int_0^{10} \frac{1}{1+x^2}$ using Simpson's $\frac{1}{3}$ rule.
15. (a) Find the root of the equation $x^3 - 5x - 7 = 0$ that lies between 2 and 3, correct to 4 decimal places, using the method of false position.
(OR)
(b) Implement Runge-kutta method using a C program.

PART C

Answer any TWO questions

2 x 20 = 40

16. (a) List and explain the input output functions in C language with suitable examples.
(b) Explain user defined functions in C.

17. (a) Solve the system of equations using Gauss Jordan elimination method.

$$5x_1 - x_2 = 9$$

$$-x_1 + 5x_2 - x_3 = 4$$

$$-x_2 + 5x_3 = -6$$

- (b) The population of a town in census is as given in the data. Estimate the population in the year 1996 using Newton's backward formula.

Year (x)	1961	1971	1981	1991	2001
Population (in 1000s)	46	66	81	93	101

18. (a) Find the positive root of the equation $3x^3 + 5x - 40 = 0$, correct to two places of decimals, using the bisection method.
(b) Write a C program to implement the Trapezoidal method.
