



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION - PHYSICS

THIRD SEMESTER – NOVEMBER 2013

PH 3812 - NUMERICAL METHODS AND C PROGRAMMING

Date : 07/11/2013
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

PART - A

Answer **ALL** Questions.

(10x2=20)

1. Reduce $y=ae^{bx}$ to linear form.
2. Discuss the Input and Output functions with example.
3. Design a simple C program to add numbers 1 to 100.
4. How is a variable declared in 'C' language?
5. Write a short note on the salient features of C Language.
6. "A string is a one-dimensional character array"-Justify it.
7. Write down the first approximation in Regula falsi method.
8. State the difference between the pre-increment and post-increment operators.
9. Write a C program to find Simple interest.
10. Apply Simpson's $1/3^{rd}$ rule to estimate the value of the integral $\int dx/x$ by dividing the interval (1,2) into four equal parts.

PART - B

Answer any **FOUR** questions

(4 x 7.5 = 30)

11. Design C program to generate Fibonacci series.
12. For a heated rod the temperature (T)in⁰ C and lengths (l) in mm is given below. If $l=a_0+a_1T$. Find the best values for a_0 and a_1 .

T	20 ⁰	30 ⁰	40 ⁰	50 ⁰	60 ⁰	70 ⁰
l	800.3	800.4	800.6	800.7	800.9	801.0

13. Write a C program to print Pasciline triangle.
14. Construct divided difference table and find F(6).

X	0	1	4	5
F(x)	8	11	68	123

15. Find the positive root of $x^3 - 5x + 3 = 0$ by using Newton Raphson method.

PART - C

Answer any **FOUR** questions

(4 x 12.5 = 50)

16. Explain the use of switch case statement in C. Write C program to accept sequence of characters and find the number of vowels and consonants using switch statements.
17. Develop a program in C to evaluate an integral using Trapezoidal rule.
18. Using Lagrange's Interpolation formula, find the value of y, when x=10 with given values.

X	5	6	9	11
Y	12	13	14	16

19. Use Runge Kutta method of fourth order to solve $y'=xy$ for x=1.4. Initially x=1; y=2 (take h=0.2).
20. Apply Gauss's elimination method to solve, $x+4y-z=-5$; $x+y-6z=-12$; $3x-y-z=4$