 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

THIRD SEMESTER – **APRIL 2012**

# PH 3812 - NUMERICAL METHODS AND C PROGRAMMING

Date : 26-04-2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART – A**

Answer **ALL** the questions (10 X 2 = 20)

1. List any two salient features of C Language.

2. Discuss the various arithmetic operators available in C.

3. What are Input and Output functions?

4. Reduce y=aebx to linear form.

5. Mention any two uses of Pointers.

6. Write down the first approximation in Regula-falsi method?

7. Given that, f(0)=8,f(1)=68 and f(5)=123,construct a divided difference table. Using the table determine the value of f(2).

8. Evaluate with h=0.25 using trapezoidal rule.

9. Write a C program to sum the series 1+2+3+…+100.

10. How are arrays declared in C?

**PART – B**

Answer any **FOUR** questions (4 X 7.5 =30)

11. Write a short note on data storage classes.

12. Explain the use of switch case statement in C.

13. Find the positive root of x3-5x+3=0 by using Newton’s method.

14. Solve the linear equations by Gauss elimination method.

2x1+4x2+2x3=15 ; 2x1+x2-2x3=-5; 4x1+x2-2x3=0

15. The temperature T (in oc) and lengths l(in nm) of heated rod is given. If l=ao+a1T, Find the best values for ao and a1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **T** | 20 | 30 | 40 | 50 | 60 | 70 |
| **l** | 800.3 | 800.4 | 800.6 | 800.7 | 800.9 | 801 |

**PART – C**

Answer any **FOUR** questions (4 X 12.5 =50)

16. Develop a ‘C’ program to accept two 4x4 matrices from the keyboard and to display the sum and difference matrices in matrix form.

17. Develop a ‘C’ program to copy the contents of a file into another.

18. Write a C program to implement a numerical integration using Simpson’s 3/5th rule.

19. Apply fourth order Runge-Kutta method to find the approximate value of y(0.2) from   
y’=y-x, y(0)=2 taking h=0.1.

20. The values of tan x for x is given, find

a) tan(0.12) b) tan(0.4) c) tan (0.5)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **x** | **0.1** | **0.15** | **0.2** | **0.25** | **0.3** |
| Y=tan x | 0.1003 | 0.1511 | 0.2027 | 0.2553 | 0.3093 |

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