 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **NOVEMBER 2012**

# PH 3812 - NUMERICAL METHODS AND C PROGRAMMING

Date : 06/11/2012 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART – A**

Answer **ALL** questions: (10x2=20)

1. Describe the structure of a C program.

2. Distinguish between main() and void main(void).

3. Write a C program to output the multiplication table.

4. Check whether the following numeric constants are valid. Give reason.

a) 67845L b) 25,000 c) +5.0E3 d) 7.1e 4 e) $ 285

5. How do variables and symbolic names differ?

6. Develop a C program to convert lowercase letter to upper case and vice-versa.

7. Apply Simpson's 1/3 rd rule to estimate the value of the integral by dividing the interval (1,2) into four equal parts.

8. 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).

9. Differentiate between break and continue statements.

10. Briefly explain the various data types in C language.

**PART – B**

Answer any **FOUR** questions : (4x7.5=30)

11. Using Newton's formula for interpolation with x and y given values and find f(7.5) for the data given below.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **F(x)** | **1** | **8** | **27** | **64** | **125** | **216** | **343** | **512** |

12. Using Newton-Raphson's method find correct to four decimal places, the roots lying in the interval 0 and 1 for the equation x3-6x+4=0.

13. Write a C program to evaluate the sum of the digits of a given number.

14 Determine y by Lagrange's formula when x=35, for the data given below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **x** | **25** | **30** | **40** | **50** |
| **y** | **52** | **67.3** | **84.1** | **94.4** |

15. Write a C program to perform integration of a function using Trapezoidal rule.

**PART – C**

Answer any **FOUR** questions : (4x12.5=50)

16. Given that dy/dx=1+y2, where y=0, when x=0, Find y(0.2) and y(0.4) by using Runge-Kutta method of order four.

17. Develop a C program to find the transpose of a matrix.

18. Find the value of y for x=0.2 when dy/dx=log(x+y) with the initial condition that y=1 for x=0 by using Euler's modified method.

19. Solve the following simultaneous equations by Gauss-Jordan method

x1+2x2+x3=8; 2x1+3x2+4x3=20; 4x1+3x2+2x3=16.

20. i) Discuss the various storage classes in C with suitable examples.

ii) Write a C program to accept a sequence of characters and find the number of vowels and consonants using switch statement.

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