2017

M.Sc. 2nd Semester Examination

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER—MTM-206 (Unit-II)

(Practical)

Full Marks : 25

Time : 1 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.

Lab 2 : (*Language : C Programming*)

Answer any *one* question on the basis of lottery

Group—A   1×20

1. (a) Write a program in C using functions to find the regression line of y on x and x on y betweeen bivariate samples in a program.

(b) Write a program in C using a function to reverse a string.

2. (a) Write a program in C using a function to search a word in a string.

(b) Write a program in C using function to find the mean of a set of n numbers.

3. (a) Write a program in C using function to check a string is palindrome or not.

(b) Write a program in C using function to find the Kth order central moment of a set of n numbers.

4. (a) Write a program in C using function to find a number from a set of data series by binary search technique.

(b) Write a program in C using a function to find the roots of a polynomial equation by Bairstow method.

5. (a) Write a program in C using function to evaluate the value of integration by trapezoidal rule taking 100 sub-intervals for the function.

(b) Write a program in C using function to find the standard deviation of a set of n numbers.

(Continued)

6. (a) Write a program in C using function to evaluate the integration by Simpson 1/3 rd rule taking n subintervals.

   (b) Writre a program in C using function to find the kurtosis of a given set of data number.

7. (a) Write a program in C using function to find a root using bisection method correct up to 5 decimal places of the equation.

   (b) Write a program in C using function to find the median of a given set of numbrs.

8. (a) Write a program in C using function to find a root using regula falsi method correct up to 5 decimal places.

   (b) Write a program in C using function to find a number from a set of data series by linear search technique.

9. (a) Write a program in C using function to find a root using Newton Raphson method correct up to 5 decimal places.

(Turn Over)

(b) Write a program in C using function to find the correlation coefficient of a bivariate sample.

10. (a) Write a program in C using function to find a root using fixed point iteration method correct up to 5 decimal places.

(b) Write a program in C using function to find a straight line fitting between two given set of data.

11. (a) Write a program in C using function to find the value of y from a differential equation, by 4th order R. K. method.

(b) Write a program in C suing function to count number of occurence of a letter in a string.

12. (a) Write a program in C using function for fitting a polynomial curve by least square method.

(b) Write a program in C using function for sorting the name in a data series of string.

13. (a) Write a program in C using function to find the value of a function by Lagrange interpolation formula.

(Continued)

(b) Write a program in C using function for sorting the element in a data series of numbers by bubble sort technique.

14. (a) Write a program in C using function to find the value of the integration by monte-carlo method for differnt value of n.

(b) Write a program in c using function to find the mean of a set of n numbers.

15. (a) Write a program in C using function to find the roots of a system of linear equations by Gauss elimination method.

(b) Write a program in C using function to count the length of a string.

16. Write a program in C using a function to find determinant of n × n matrix by Gauss elimination method.

17. Find matrix inverse by Gaussian elimination with partial pivating via C programming. Consider general n × n matrix.

18. (a) Write a C program using a function to solve the following ODE and find the value of y(1) using Runge - Kutta method

$$\frac{dy}{dx} = y - x^2 + 1$$

y(0) = 0.5

(b) Solve the problem using the modified Euler method and compare the result with the exact solution

$$\frac{dy}{dx} = \frac{2y}{x} + x, \ x \in [1, \ 1.4], \ y(1) = 1$$

19. (a) Write a C program using function to find dominant eigen pair of the following matrix by power method

$$\begin{bmatrix} 0 & 11 & -5 \\ -2 & 17 & -7 \\ -4 & 26 & -10 \end{bmatrix}$$

(Correct up to 3-significant figures)

20. Write a C-program using a function to solve a tridiogonal system of linear equations by Thomas algorithm.

(Continued)

21. Write a C-program to input a string and an integer (key). Encode a given string depending on the key supplied. Each letter of the string moves ahead (positive key) or back (negative key) in the alphabet list depending on the value of key. For example with key 4-

INPUT-

This is an example

OUTPUT-

Xlmw mw ibeqtpi

22. Write a menu-driven C-program to do the following

(a) Input a Name (first middle surname)

(b) Menu List-

   1. Initial of first name along with Surname

   2. Initial of first name and middle name along with Surname

   3. Initials of all three

   For example if the name is-Sachin Ramesh Tendulkar

   If the entered choice is 1 output should be S Tendulkar

   If the entered choice is 2 output should be S R Tendulkar

(Turn Over)

If the entered choice is 3 output should be SRT

For any choice other than 1, 2, 3 the user should be made to re-enter the choices.

[Viva Voce + Note Book — 05]

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