M.Sc. 2nd Semester Examination, 2014

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER—MTM-206 (Unit — II)

Lab. 2 : (*Language* : C-*Programming*)

[*Marks* : 25]

Time : 2 hours

Answer any **two** questions

Problem : 20 marks ; Lab. note book and viva : 5 marks

Question will be selected by lottery

1. Write a C program to solve of an equation $f(x) = 0$ by bisection method. Test your program for the equation $10x^{10} + 7x^7 + 5x^4 + 9x^3 + 7x + 1 = 0$.

2. Write a C program to solve of an equation $f(x) = 0$ by Interation method. Test your program for the equation $7 \cdot 43x^7 + 10x^5 - 10 \cdot 543x^3 + 9x^2 + 5x + 4 = 0$.

3. Write a C program to solve of an equation $f(x) = 0$ by Newton-Raphson method. Test your program for the equation $x^3 + 4x^2 + 7 = 0$.

4. Write a C program to evaluate any polynomial by Horner's method. Test your program for the polynomial $6x^7 - 7x^5 - 2x^4 - 10x^2 + 2x - 6$.

5. Write a C program to find the median of a simple frequency distribution. Test using the following data :

Class interval :	0-8	8-16	16-24	24-32	32-40	40-48
Frequency :	8	7	16	24	15	7

(*Turn Over*)

6. Write a C program to find the quartile of a simple frequency distribution. Test using the following data :

Class interval :	0-8	8-16	16-24	24-32	32-40	40-48
Frequency :	8	7	16	24	15	7

7. Write a C program to find the standard deviation of a simple frequency distribution. Test using the following data :

X	5	4	3	2	1
Y	8	10	4	6	2

8. Write a C program to find the moments upto forth orders of a simple frequency distribution.

9. Write a C program to find the skewness, kurtosis, beta and gamma coefficients of a simple frequency distribution.

10. Write a C program to find the mode on group distribution.

11. Write a C program to find the correlation coefficient on bivariate distribution. Test using the following data :

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

12. Write a C program to find the regression lines on bivariate distribution. Using the set of points, test it.

x	4	6	8	10	12
y	13·72	12·90	12·01	11·14	10·31

13. Write a C program to fit a straight line for bivariate distribution. Using the set of points, test it.

x	4	6	8	10	12
y	13·72	12·90	12·01	11·14	10·31

14. Write program in C to find a given number in a list of numbers by binary search.

15. Write program to sort a list of numbers using insertion sort technique.

16. Write a C program on number of occurrence of a letter in a given string. Test your program for the occurrence of the letter 'm' in the string 'mathematics'.

17. Write a C program on whether a string is palindrome or not. Test your program for the string malayalam and mathematics

18. Write a C program on rewriting a name with surname first. Test your program for the name Sourav Ganguli.

19. Write a C program to print a string in a reverse order. Test your program for the string Midnapore.

20. Write a C program on string searching. Write a C program on sorting of names in alphabetical order. Test your program for the names Tarun, Tanmoy, Sankha, Asit, Rahul, Bimal, Tapan, Debdas, Faruk, Eshapatik.

21. Write a C program on finding and replacing a given letter or word in a given string.

22. Write a C program on conversion of a given name into its abbreviation form. Test your program for the name Satyabrata Paul.

23. Write a C program on generation of 100 random numbers, between 200 and 500.

24. Write a C program on multiple choice test.

25. Write a C program on multiplication of poly- nomials. Test your program for the polynomials $1 \cdot 25x^7 - 7 \cdot 2x^5 - 2 \cdot 25x^4 - 10 \cdot 5x^2 + 20 \cdot 2x - 6 \cdot 0$ and $6 \cdot 7x^5 + 2 \cdot 2x^4 - 8 \cdot 5x^2 + 20 \cdot 4x + 7$.

26. Write a C program to find the inverse of a matrix. Test your program for the following matrix :

$$\begin{pmatrix} 1 & 1 & 9 & -2 \\ 4 & 4 & 1 & -1 \\ 5 & 5 & 6 & -3 \\ 4 & 1 & 3 & 1 \end{pmatrix}.$$

27. Write a C program on multiplication of matrices. Test your program for the following matrices :

$$\begin{pmatrix} 1 & 1 & 9 & -2 \\ 4 & 4 & 1 & -1 \\ 5 & 5 & 6 & -3 \\ 4 & 1 & 3 & 1 \end{pmatrix} \text{ and } \begin{pmatrix} 3 & 5 & 9 & -2 \\ 4 & 6 & 1 & -1 \\ -3 & 4 & -7 & -3 \\ 4 & 1 & -2 & 9 \end{pmatrix}$$

28. Write a C program on splitting of numbers and find the sum of the digits. Test your program for the number 53658.

29. Write a C program to convert decimal number to binary form and vice-versa. Test your program for the number 869542.

30. Write a C program to convert decimal number to octal form and vice-versa. Test your program for the number 21143582.

31. Write a C program to convert decimal number to hexadecimal form and vice-versa. Test your program for the number 8532426.

———————