2008

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

(1st Semester Examination)

(*Introduction to Computing*)

PAPER—MA-1104

Full Marks : 50

Time : 2 hours

Answer **Q. No. 1** and any **four** from the rest

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers whenever necessary

1. Answer any *two* questions : 2×2

   (a) Explain the difference between $i{+}{+}$ and $++i$ with suitable examples.

(b) What are the decimal values of the binary numbers 10110101 and 01010010 in 1's complement and 2's complement form respectively.

(c) Explain Macro expansion in C.

2. (a) What is Gray coding? Write down the rules to convert from a binary number to a Gray code and a Gray code to binary number. Explain with examples.

(b) Write a program in C to search a number from a sorted list of numbers using Binary Search Technique. $(1 + 2 + 1) + 5$

3. (a) How is a multi-dimensional array defined in terms of an array of pointers? What does each pointer represent? How does this definition differ from a pointer to a collection of contiguous arrays of lower dimensionality?

(b) Write a C program for multiplication of $m \times n$ and $n \times p$ matrices. $(2 + 1 + 2) + 4$

4. (a) What is the purpose of the break statement ? What is the effect of absence of break in switch statement ? Explain switch case statement with a suitable example.

   (b) Write a program in C to arrange a list of names using arrays of pointers. $(1 + 1 + 2) + 5$

5. (a) What is meant by the storage class of a variable ? Explain the available storage class specifications in C.

   (b) Write a program to obtain the roots to calculate and display all roots of the quadratic equation $ax^2 + bx + c = 0$. $5 + 4$

6. (a) What is recursion ? What advantage is there in its use ? Write a program in C to find Ln using recursion.

   (b) What is a structure ? How does a structure differ from an array ? $(1 + 1 + 4) + (2 + 1)$

(Turn Over)

7. (a) Using Karnaugh map, simplify the following Boolean function

$$f(A, B, C, D) = \sum (1, 3, 5, 6, 8, 11, 13) + \sum_d (0, 2, 4).$$

(b) Explain floating-point representation of a real number with the help of a register with a capacity of six digits and a sign bit. Pictorially illustrate the following floating-point representation of -0.0801×10^{-4} by the said register. 4 + 5

[*Internal Assessment* — 10 Marks]