M.Sc. 1st Semester Examination 2009

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

(*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

1. Answer any *two* questions: 2×2

(*a*) Encode $(39,584)_{10}$ into 8421 BCD number.

(*b*) Rewrite the following program segment using conditional operator:

```
if (x<0)
  i=0;
else
  i=1;
```

(*c*) Find the value of $0{\cdot}4061 \times 10^3 + 0{\cdot}2668 \times 10^2$ using a register with a capacity of six digits and a sign bit and the excess 50 form representation.

2. (*a*) Explain BCD coding. Write down the algorithm of BCD addition. Add the following BCD numbers:

$$01100111 + 01010011$$

(*b*) The number e can be defined as the limit of $\left(1+\frac{1}{n}\right)^n$ as n(integer) gets larger and larger. Write a program in C to approximate the value of e. Stop when the difference between two successive approximations is less than 0·0001. Print out the values of e and n. $(1 + 1 + 2) + 5$

3. (*a*) Using Karnaugh map, simplify the following function:

$$F(A, B, C, D) = \sum (1, 3, 5, 8, 9, 11, 15) + \sum_{\phi} (2, 13).$$

(*b*) Explain call by value and call by reference with suitable examples. 5 + 4

4. (*a*) Write a program that will generate every third integer, biginning with $i = 2$ and containing for all integers that are less than 100. Calculate the sum of those integers that are evenly divisible by 5.

(*b*) Explain the use of the following functions:

strcpy( ) and strren( ). 5 + 4

5. (*a*) Explain the concepts of pointer and pointer variable. How can a pointer variable be initialized ? What is the relationship between an array and a pointer ?

(*b*) Write a program in C to find the sum of the digits of an integer number. 5 + 4

6. (*a*) Write a program to read a file and count the number of characters read.

(*b*) What is do...while statement? How is it different from while statement? What is the purpose of the for-statement? 5 + 4

7. (*a*) Design a combinational circuit with three inputs x, y, z and three output A, B, C. When the binary input is 0, 1, 2, or 3, the binary output is one greater than the input. When the binary input is 4, 5, 6, or 7, the binary output is one less than the input.

(*b*) Write a program in C to (*i*) read and write a line using 'getchar' and 'putchar' functions, (*ii*) count a particular letter in a given string. 4 + 5

[*Internal Assessment* : 10 Marks]