M.Sc. 1st Semester Examination, 2013

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

(*Introduction to Computing*)

PAPER—MTM-104

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*) Express (– 25) in (*i*) sign magnitude form, (*ii*) 1's complement form and 2's complement form using 8 bits register.

(*b*) What will be the output of the following program and explain it :

```
Void main ( )
{ int i ;
  for (i=1; i++<=5; Print f("%d",i));
  }
```

(*c*) Perform BCA addition of the following numbers. Show result in BCD form. 67 + 53 = ?

2. (*a*) What is an escape sequence ? What is its purpose ? Can escape sequences be included in a string constant ? Explain how do string constants differ from character constants ?

(*b*) Declaring two arrays A and B, write a program in C to find A ∪ B. 4 + 5

3. (*a*) Explain the parity method for error detection. Determine the single-error correcting code for the information bits 1101 using odd parity.

(*b*) Write a program to print first *n* natural numbers without using any loops. 5 + 4

4. (*a*) What is storage class ? What types of storage class are available in C ? Explain with examples.

(*b*) Write a program in C to display all prime numbers which are also Fibonacci numbers within a range given by you. 5 + 4

5. (*a*) Explain the general form of a user defined function in C and an example with justification.

(*b*) Write a C program to calculate the roots of the quadratic equation. 4 + 5

6. (*a*) How do we initialize the structure during declaration ? Give an example. Explain the difference between two member access operators '.' and '→'. What is a union ? How does it differ from a structure ?

(*b*) The value of π can be calculated from the infinite series

$$\pi = 4 - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \frac{4}{11} + \cdots$$

write a program to find out the number of terms which have to be used before first getting the value 3·1415. 5 + 4

7. (*a*) Simplify the boolean function

$$F(w, x, y, z) = \sum(1, 3, 7, 11, 15)$$

with the don't care conditions

$$d(w, x, y, z) = \sum(0, 2, 5)$$

(*b*) Explain Macro and Enumeration with suitable examples. 5 + 4

[*Internal Assessment* : 10 Marks]