Total number of printed pages – 7          MCA

PCS 1001/MCC 101

First Semester Examination – 2008

PROGRAMMING IN C

Full Marks – 70

Time : 3 Hours

Answer Question No. **1** which is compulsory
and any **five** from the rest.

The figures in the right-hand margin
indicate marks.

1.   Answer the following questions :          2×10

(a)   What are the function of **control unit** of
a typical processor ?

(b)   Define and differentiate between primary
memory and secondary memory.

P.T.O.

(c) Differentiate between While and Do While Loop.

(d) What is a self–referential structure ?

(e) What is a stream pointer ?

(f) How is an array name interpreted, when it is passed to a function ?

(g) What are the fundamental data types in C ? Explain the use of bitwise operators in C with examples.

(h) Difference between array with functions and array with pointers.

(i) What is the difference between break and continue statement ? Explain with the help of examples.

(j) Read the following recursive program and answer the questions below :

```
int f(int k, int m)
{
    if (k >= m) return 0;
    else if (m%k == 0) return 1;
    else return f(k+1, m);
}
```

What is the output on inputs $k = 5$ and $m = 9$ ?

2. (a) What is purpose of switch statement ? Summarize the syntax rule associated with the use of the switch statement.    4

(b) Write a C program that will generate a table of values for the equation :

$$f(x,y) = 2e^x y^3 + (23 + y)^x$$

where $1 \leq x \leq 20$ with an increment 1 and $1 \leq y \leq 5$ with an increment 0.25.    6

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PCS 1001/MCC 101    3    P.T.O.

3. (a) Explain the structure of the hard disk. Discuss the characteristics of hard disk storage. 5

(b) Write a main function that tests **odd_sum()** by reading an integer from the keyboard and if the integer is positive, **odd_sum()** should be called and the returned value is written on the screen. 5

4. (a) Write a program that will generate an array of 10 integer numbers from 0 to 30 using the function **rand()** present in stdlib.h library. 5

(b) Explain the role of memory in computer system. What are the most common type of computer memory and memory technology used ? 5

5. (a) Write a logical function **sorted** in C that receives an array of **int** values and **n** representing the number of values. The function will return **1** if the array values are sorted in increasing order, **0** otherwise. 5

(b) Using array declaration for Fibonacci series, write a C program to generate first n terms. 5

6. (a) Define a structure consisting of two floating point members, called *real* and *imaginary*. Include the tag **complex** within the definition. 5

(b) Write a function in C that takes a string as the single parameter and returns the integer 1 if the string is a palindrome. Otherwise zero should be returned. 5

7. (a) How an array of structure is initialized ? How is a structure member accessed ? How can a structure member be processed ? Explain with relevant example. 5

(b) Write the function odd_sum() in C with function head

**int odd_sum(int n)**

The function should return the sum of all odd numbers between 1 and n (including 1 and n), and you may assume that n>=1).

5

8. (a) Explain what the recursive function below does. Do not describe, row by row, what the function does, rather you should explain what problem the function solves.

```c
void secret(int number)

{

    assert(number >= 0);

        if (number)

                    secret(number/2);

        printf("%d", number%2);

}
```

Illustrate your explanation by showing what happens when the function is called by **secret (12)** ?

5

(b) What is a structure ? What is a *structure member*? What is the relationship between a *structure member* and a *structure*?

5