

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.

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 $n \geq 1$.

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.

```
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

5