Reg. No. :

Y 1503

M.C.A. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2008.

First Semester

DMC 1602 — PROBLEM SOLVING AND PROGRAMMING

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the factors used in analyzing the efficiency of an algorithm.

2. Write the advantages of Top-down design.

3. State an application of binary doubling technique.

4. Design an algorithm to iteratively compute the reciprocal of number N.

5. Write a note on data type Qualifiers.

6. Write a C program to find the length of a string without using built -in function.

7. Write down the output of the following program :

```
main ( )
{
 static int i = 3 ;
 print f ( "%d", i--) ;
 return i > 0? main ( ) : 0 ;
}
```

8. Write the difference between Char constant and String constant.

9. Write the differences between formatted and unformatted data file.

10. How will you represent a list of names using pointer?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the implementation of an algorithm. (8)

(ii) Discuss the various problem solving strategies. (8)

Or

(b) (i) Describe the steps involved in solving the given problem. (8)

(ii) Discuss the order of growth of an algorithm. (8)

12. (a) Design and analyze an algorithm for the following :

(i) Find the maximum number of a set using array partition technique. (8)

(ii) Using the factoring technique, compute the square root of number N. (4)

(iii) Using the factoring technique, find the GCD of two numbers. (4)

Or

(b) (i) Write an algorithm to find K^{th} smallest element in a random ordered list without using sorting technique. (10)

(ii) Discuss the merits and demerits of using an array. (4)

(iii) Write the application of base conversion method. (2)

13. (a) (i) Discuss the unary operators of C programming language. (6)

(ii) Write the differences between while-do and do-while statement. (4)

(iii) Write the purpose of following functions. (6)

(1) getch ( )

(2) putchar ( )

(3) fgetc ( )

(4) gets ( )

(5) puts ( )

(6) fscanf ( ).

Or

(b) Write a menu driven program to do the following over a list of N numbers.

(i) Find the descending order of a list. (6)

(ii) Compute the frequency of given number X. (4)

(iii) Find the sum of positive and negative numbers. (4)

(iv) Find the number of even elements. (2)

14. (a) (i) Write the differences between Union and Structure. (4)

(ii) Discuss the parameter passing techniques of functions with an example. (12)

Or

(b) (i) Write a C program to evaluate the series

$(1 * X) + (2 * X) + (3 * X) + \ldots + (N * X)$ using recursion. (8)

(ii) Describe about the data structure used for recursive function call. (2)

(iii) Define the term self referential structure with an example. (6)

15. (a) (i) Write the storage classes of C programming. (8)

(ii) Describe the functions used in C for supporting dynamic allocation, deallocation and reallocation. (4)

(iii) Write the classification of preprocessor directives. (4)

Or

(b) Write a C program to store the details (employee number , name , department, designation and the number of years of experience in the company) of employees using formatted file and display the menu to perform the following operations.

(i) Display the information of given employee number (4)

(ii) List the details of all employees (4)

(iii) List the name of employees having work experience greater than ten years. (4)

(iv) Sort the employee details with respect to their net salary. (4)
