

G 3502

M.C.A. DEGREE EXAMINATION, MAY/JUNE 2007.

First Semester

MC 1602 — PROBLEM SOLVING AND PROGRAMMING

(Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Algorithm.
2. What are the factors required for analysis of algorithm?
3. Describe the algorithm to find the biggest of three numbers.
4. Describe the need for arrays in problem solving.
5. How prefixing and post fixing of increment operator to a variable affects the assignment statement?
6. What will the output of following segment if $n = -1$ and $n = 0$?

```
x = 2;
```

```
y = 2;
```

```
if (n < 0)
```

```
  x = x - 2;
```

```
  y = y + 1;
```

```
printf ("%d%d", x, y)
```

Define a structure called book with three members viz name of the book, no of pages and cost.

What is a recursive function?

What is pointer declaration? Illustrate.

Distinguish between "r" and "rt" mode in the context of files.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe an algorithm to find the smallest integer in a set of integers. (6)
- (ii) Discuss bubble sort algorithm with an illustration. (10)

Or

- (b) (i) Explain the steps involved in analysing an algorithm. (8)
- (ii) Write detailed notes on top down design. (8)
12. (a) (i) Design an algorithm that converts binary number to decimal demonstrate. (10)
- (ii) Give an algorithm for swapping two values with out using any temporary variables. (6)

Or

- (b) (i) Discuss in detail the factors that contribute to the efficiency of an algorithm. (6)
- (ii) Give an algorithm for finding the factorial by (1) recursion (2) iteration with an illustration. (10)
13. (a) Explain in detail various looping statements in C language with illustrative example for each. (16)

Or

- (b) (i) Explain the precedence of arithmetic operators in C-language with an example. (8)
- (ii) Write a C program to find the roots of a quadratic equation. (8)
14. (a) (i) What is the need for user defined function? Write a function to add two nos. (8)
- (ii) Discuss briefly about various string handling functions available in C. (8)

Or

- (b) Define a structure called 'student' with members name, Reg. No. Subject 1 marks, Subject 2 mark and total. Write a program to read data for 5 students and rank them based on their total and print the results. (16)

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15. (a) (i) Write a program using pointers to read in an array of integers and print its element in reverse order. (8)
- (ii) What is a pre processor? Explain about two types of pre processor. (8)

Or

- (b) Write short notes on : (4 × 4 = 16)
- (i) Dynamic memory allocation
- (ii) Linked lists
- (iii) File modes
- (iv) Array of structures.

```
for(i=0; i<n; i++)
    a[i];

for(i=0; i<n; i++)
    a[++i] = b[i];
```