G 8352

M.C.A. DEGREE EXAMINATION, JANUARY 2006.

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. List the factors for the analysis of algorithm.

3. Distinguish between top down and bottom up design.

4. List few limitations of an array.

5. How do variables and symbolic names differ?

6. In what ways does a Switch statement differ from an If statement?

7. How does a structure differ from an array?

8. Distinguish between local and global variable.

9. What is the difference between Call by value and Call by reference?

10. What is dynamic memory allocation? How does it help in building complex programs?

PART B — (5 × 16 = 80 marks)

11. (i)   Explain with an example the different looping statements.   (10)

    (ii) Write a C program to print the prime numbers between 1 and 100.   (6)

12. (a) (i)   Explain the steps involved in analyzing an algorithm.   (8)

        (ii) Write detailed notes on Top down design.   (8)

Or

(b) (i) Explain in detail about the Problem solving aspects. (8)

(ii) With appropriate examples, Explain how an algorithm is analyzed for best, worst and average cases for time and space. (8)

13. (a) (i) Given two variables of integer type 'a' and 'b' exchange their values without using a third temporary variable. Write an algorithm. (6)

(ii) Design an algorithm that converts Binary numbers to decimal and Binary numbers to Octal. (10)

Or

(b) (i) Explain the significance of Array Techniques. (6)

(ii) Explain about Factoring methods and write an algorithm to find the greatest common divisor of two numbers. (10)

14. (a) (i) Explain recursive function with an example program. (8)

(ii) Briefly explain about Storage classes. (8)

Or

(b) Define a structure that can describe a Hotel. It should have members that include the name, address, grade, average room charge and number of rooms. Write functions to perform the following operations.

(i) To print the hotels of a given grade in order of charges.

(ii) To print out the hotels with room charges less than a given value.

15. (a) (i) Write a program using pointers to read in an array of integers and print its elements in reverse order. (8)

(ii) Explain about Preprocessors. (8)

Or

G 8352

(b) (i) Describe different types of Linked Lists. (6)

(ii) Write a C program that will generate a data file containing the list of customers and their corresponding telephone numbers. Provide the following functions to access the data file.

Determine the telephone number of a specified customer.

Determine the customer details whose telephone number is specified. (10)

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G 8352