2012

MCA

1st Semester Examination

INTRODUCTION TO PROGRAMMING LANGUAGE
&
DATA STRUCTURE

PAPER—MCA-101

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group—A

Answer Q. No. *1* and any *three* from the rest.

1. What is C Preprocessor? Describe any one of the Preprocessor directives with suitable examples. 1+4

2. (a) Differentiate between auto variables and static variables.

(b) What do you mean by 'call by reference' of a function? How does 'call by value' differs with it?

(c) With suitable example, explain the functionality of ternary operator in C. 3+(2+2)+3

3. (a) What is recursion? How it differs from iteration?

(b) Create a structure to specify data on students given below :

Roll_number, name, Department, Year_of_joining.

Assume that there are not more than 450 students in the college.

(i) Write a function to print names of all students who joined in a particular year.

(ii) Write a function to print the data of a student whose roll no. is given. 2+(4+4)

4. (a) Using the concept of pointers, construct a function that accept a string and evaluates the length of that string.

(b) What do you mean by file opening modes? Describe any three of them. 5+(2+3)

5. (a) What do you mean by macro? Give an example.

(b) How does a macro differs from a function?

(c) What is conditional compilation? Explain. 3+3+4

6. Write short notes (any *five*) : 5×2

(a) Switch statement ;

(b) Escape sequence in C ;

(c) Array of pointers ;

(d) getche() function ;

(e) argc and argv ;

(f) strcmpi().

Internal Assessment – 15

Group—B

Answer Q. No. 7 and any *two* from the rest.

7. Write bubble sort algorithm and apply it on the following list :

11 –3 0 5 7 8 –4 16 2.

What is the average case complexity of this algorithm. 6+1

8. (i) Implement typical stack operation when stacks are represented using (1) arrays and (2) using singly linked lists.

(ii) Give the iterative algorithm for the inorder traversal of a binary tree. 8+6

9. (i) Write a C program using stack to check whether a given string is palindrome or not.

(ii) Write algorithms to insert into and delete elements from a doubly linked list. 7+7

10. (i) What is binary tree? 6

(ii) Write an algorithm to count number of nodes in a singly linked list.

(iii) List out the advantages and disadvantages of doubly linked list over singly linked list.

(iv) Draw a binary tree for the following expression :

3 + 4 * (6 – 7) / 5 + 3. 2+5+3+4

Internal Assessment – 15