

MCA 1st Semester Examination, 2013

**INTRODUCTION TO PROGRAMMING
LANGUAGE**

PAPER—MCA-101 (Group A & B)

Full Marks : 100

Time : 3 hours

The figures in the right-hand margin indicate marks

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

Illustrate the answers wherever necessary

GROUP – A

[Marks : 35]

(C-language)

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

- 1. What do you mean by dynamic memory allocation in C ? How can we achieve it ? Describe briefly with an example ?**

5

(Turn Over)

2. (a) Describe the functions of typecast operator and size of operator briefly. 4
- (b) Compare the use of switch statement with the use of nested if-else statement ? Which is more convenient and why ? 4
- (c) What do you mean by user defined data types ? Give example. 2
3. (a) Compare the purpose of the 'break' statement with that of the 'continue' statement. Within which control statements can they be included ? State each of them individually. 4
- (b) Write the difference between call by value and call by reference in C. 3
- (c) What is recursion ? How it differs from iteration ? Explain. 3
4. (a) What is C preprocessor ? Explain the concept of # pragma in this context. 4

(3)

(b) What is command-line argument ? Write a program in C that will receive a file name and a line of text as command-line arguments and write the text to the file. 1 + 5

5. (a) Write down the differences between : $2\frac{1}{2} \times 2$

(i) Global variable and static variable

(ii) Structure and union.

(b) What do you mean by file opening modes ? Distinguish between "r" and "r+" modes in this concern. 5

6. Write short notes (any four) : $2\frac{1}{2} \times 4$

(i) Enumerated data type

(ii) Disadvantage of array

(iii) Value of operator

(iv) do-while loop

(v) Precedence of operators in C

(vi) Scope of variable.

[Internal Assessment : 15 Marks]

(4)

GROUP – B

[Marks : 35]

(Data Structure)

Answer any five questions

1. (a) Define sorting. What do you mean by external sorting? 1 + 1
(b) Write selection sort algorithm to apply it with following data
20, 60, 40, 50, 10, 90, 80, 30 5
2. Explain binary search algorithm to search an item 30 from the data set of Q - 1(b). 7
3. Implement Queue operation (with shifting concept) by push, pop and display subprogram. 7
4. (a) How application of stack can be proved to find out the factorial of any number by recursion. 4

(5)

(b) What are the steps require to check whether the following parathesis is correct or not

(()) . () (()) 3

5. Write C program to insert and delete element from circular linked list. 7

6. (a) Write an algorithm to compute the height of binary tree. 3

(b) Draw the corresponding binary tree whose

Preorder : *A B C D F H J M K E G I L N*

Inorder : *A D J M H K F C I N L G E B*

4

7. (a) Prove that the maximum number of nodes in a binary tree of depth K is $2^K - 1$, $K \geq 1$. 3

(b) Draw all possible binary search tree containing 4 elements

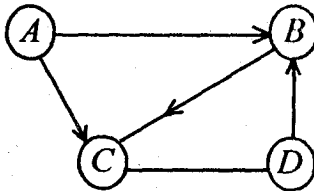
1, 2, 3, 4. 4

8. (a) Draw

(i) Adjacency list and

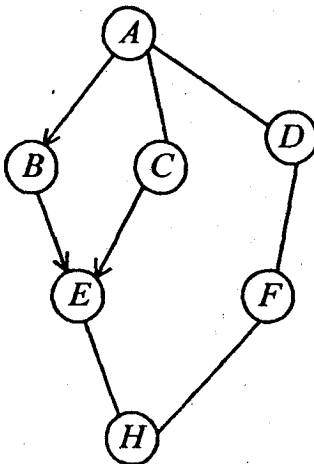
(ii) Adjacency matrix for the following graph

3



(b) Show the output of the following graph by Depth-First Search.

4



(7)

9. (a) What are the advantages of linked list over array? 3
- (b) Find the maximum number of nodes in a binary tree of depth 5. 2
- (c) Write short notes on ADT. 2

[*Internal Assessment : 15 Marks*]
