MASTER'S IN MATHEMATICS WITH APPLICATIONS IN COMPUTER SCIENCE M.Sc. (MACS)

Term-End Examination

June, 2011

MMT-001 : PROGRAMMING AND DATA STRUCTURES

Time : 1½ hours   *Maximum Marks : 25*

Note :   *Question No. 1 is **compulsory**. Answer **any three** questions from question no. 2 to 5. All programs should be written in 'C' language. Use of calculator is **not** allowed.*

1.   Which of the following statements are *true* and which are *false* ? Justify your answer with a short proof or a counter example.   **2x5=10**

(a)   int a, b ;

for (a = 49 ; a < 52 ; a + +) {

for (b = 51 ; b > a -- 1 ; b -- --)

printf ("%c", b) ; printf ("\n") ; }
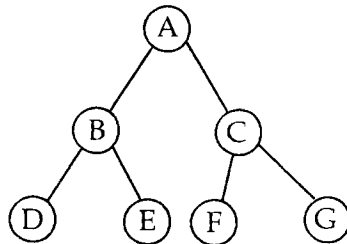
the output of the above logic is

321

32

3

(b) For the following Inorder and Preorder Traversals :

Inorder : DBEAFCG

Preorder : ABDECFG

The Binary Tree is as given below :

(c) The following declaration is valid : float bar 5×1.5.

(d) The value of the variable y after execution of the third line is 400 :

int x [15) = {100, 200, 30(↳ 400, 500}, *p, y ;

P = x ;

y = x (P + 3) ;

(e) Deallocation of a node can take place when an application which claimed the node releases it back to the operating system.

2. (a) Define a 'MACRO' and a 'FUNCTION'.   2
Explain with an example for each.

(b) What is the purpose of the switch - case -   3
default statement ? Explain the statement with an example.

3. (a) What is a Priority Queue ? Write anyone advantage of it. **2**

   (b) Write a program that reads a list of names and sort all characters in each name in alphabetical order. **3**

4. (a) Write a program for implementation of a STACK. Use PUSH and POP functions for insertion and deletion of an element respectively. PUSH is an operation for inserting an element into the STACK and POP in an operation to remove an element from STACK. **3**

   (b) Explain "fprintf ( )" and "fscanf ( )" functions with an example. **2**

5. Write a menu driven program for implementation of a 'single linked list'. **5**

   Each node should contain 'name' and 'age' fields.

   The implementation should include Creation, Insertion, Deletion and Display operations.

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