

00575

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

Term-End Examination

December, 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.

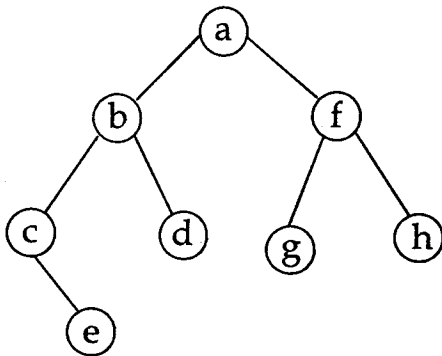
1. Write the output of the following pieces of code 10
in C language. Justify your answer with short
explanations.

(a) `int n=100, a[10], c=1;`
`while (n > 0) {a[c]=n%8 ; c++ ; n/=8 ;}`
`for (c-- =1 ; c > 0 ; c--) Printf ("%2d", a[c]);`

(b) `main () {`
`int a=10, b=20;`
`abc(&a, &b) ; Printf ("%d %d", a, b);}`
`abc (int*x, int*y) {*x+ =10; *y+ = 10;`
`Printf ("%d %d", *x, *y); }`

- (c) `int a=0, n=786;`
`while (n > 0) {a=a*10+n%10; n/=10;}`
`printf ("%d", a);`
`main () {`
`int i;`
- (d) `for (i=1; i < 4; i++) stat ();`
`stat () { static int x=0;`
`x+=1; printf ("X=%d\n",x); }`
- (e) `main ()`
`{int i=0;`
`switch (i)`
`{case 0: i++;`
`case 1: i++ + 2;`
`case 2: ++i;`
`}`
`Printf ("%d", i++);`
`}`

2. (a) Write the POST ORDER traversal of the Binary Tree given below, giving all the steps involved. 2



- (b) Illustrate the *malloc* and *calloc* functions in 'C' language. 3
3. (a) A commercial bank has introduced an incentive policy of giving a bonus to all its deposit holders. The policy is as follows. If the depositor is a male senior citizen, he is paid a bonus of 5% of the balance held on 31st December. If the depositor is a female senior citizen, she is paid a bonus of 7% of the balance held on 31st December. If the depositor falls in neither category, a bonus of 2% of the balance held on 31st December is paid. Write an interactive C programme that reads the balance on 31st December, sex and age of the depositor and prints the bonus amount. 3
- (b) Briefly explain the use of the following STRING functions in 'C' giving an example of each also. 2
- (i) Strncmp () (ii) Strcat ()
4. Write an interactive program for implementation of a 'singly linked list'. The implementation should include Creation, Insertion, Deletion and Display operations. 5

5. (a) Write the Step-by-step procedure to create a BST with the following nodes : 3
32, 48, 11, 22, 8, 62, 26, 14
- Also, give the procedure for deleting the node "22" from BST.
- (b) Write a macro in C language to find the smallest of three given numbers. 2
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