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MMT-001

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

00822 Term-End Examination

December, 2014

MMT-001 : PROGRAMMING AND DATA STRUCTURES

Time : $1\frac{1}{2}$ hours *Maximum Marks : 25*

(Weightage : 20%)

Note : *Question no.* ***5*** *is* ***compulsory****. Answer any* ***three*** *questions from questions no.* ***1*** *to* ***4****.* ***All*** *programs should be written in 'C' language. Use of calculators is* ***not*** *allowed.*

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1. (a) Write a 'C' function to interchange any two rows of a 2-D array of integers passed to it. Assume that the array is of size 5×4. *3*

(b) Will the output of code 1 and code 2 given below be the same ? Justify your answer. 2

```
//code 1
int i=0;
do{
    i++;
    printf("%d", 2*i);
}while(i<=10);

//code 2
int i=0;
while(i<=10)
  {
    i++;
    printf("%d", 2*i);
  }
```

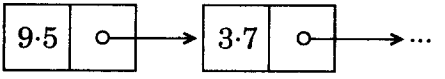
2. (a) Evaluate the following expression which is in RPN, clearly showing all the stages : 2

5, 3, 5, –, 2, 3, +, /, +

(b) Differentiate between struct and union with the help of suitable examples. 3

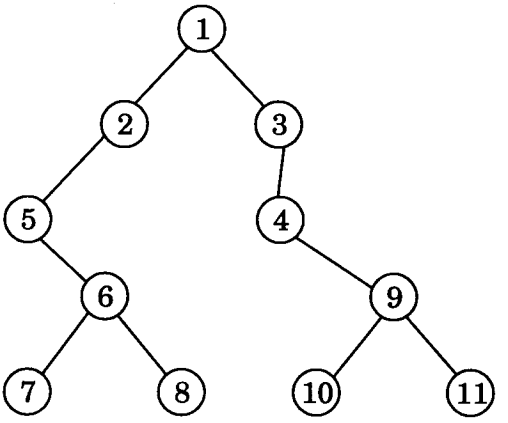
3. (a) Write a function to reverse a string. 2

(b) Consider a singly linked list of real numbers. For example,



Declare a node for this list. Write a function to add a node before the first node of this list. 3

4. (a) Write down the inorder, preorder and postorder traversal of the given tree : 3



(b) Find the value of the following expressions : 2

(i) $7 * 6 \% 15 / 3$;

(ii) $2 - 3 / 5 + 6 * 3 \% 3$;

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

(a)

```
#define f(A, B) (A>=B) ? A:B
int main()
{
   int A=5, B=6;
   printf("%d", f(A, B));
   return 0;
}
```

(b)
```
enum colors
{ RED, GREEN=2, BLUE, BLACK, YELLOW};
printf("%d", YELLOW);
```

(c)
```
int a=0;
if(a=0)
    printf("C is difficult");
printf("C is easy");
```

(d)
```
char *p1="Ramesh";
char *p2;
p2=(char*)malloc(20);
while(*p2++=*p1++);
printf("%s",*p2);
```

(e)
```
char ch= 'A';
  switch(ch)
  {
    case 'A':
    case 'B':
    case 'C':   printf("%c", ch++);
    case 'D':   printf("%c", ch);
                break;
    case 'E': ch++;
  }
```