**Microsoft 2012**

Round 1:

No. of questions: 15 Time: 45 min.

1. Find the output:  
   #include<stdio.h>  
   int fun(int num)  
   {  
   while(num > 0)  
   {  
   num=num\*fun(num-1);  
   }  
   return num;  
   }  
   void main()  
   {  
   x = fun(8);  
   printf(“%d”,x);  
   }
2. Find the output:  
   #include<stdio.h>  
   int fun(int n)  
   {  
   int val=num<<3;  
   val+=num;  
   return val;  
   }  
   void main()  
   {  
   int x,y,z;  
   x=fun(0);  
   y=fun(1);  
   z=fun(3);  
   printf(“%d %d %d”,x,y,z);  
   }
3. Rabbits problem
4. The program is to print all the characters using ASCII values. Find the errors in the program:  
   #include<stdio.h>  
   main()  
   {  
   char ch;  
   while(ch>256)  
   {  
   printf(“%c”,++ch);  
   }  
   }  
   Options: (Select all that apply)  
   a) ch should be initialized to 0  
   b) ch should be initialized to 1  
   c) In printf statement, it should be ch++  
   d) The condition for while loop should be ch<255  
   e) The condition for while loop should be ch<256  
   f)
5. Find the output of the program:  
   #include<stdio.h>  
   #define x 5+2  
   main()  
   {  
   int i;  
   i=x\*x;  
   printf(“%d”,i);  
   }
6. Find the output of the program:  
   #include<stdio.h>  
   void dosomething(int num)  
   {  
   int mask=~(1<<5-1);  
   int res=num&mask;  
   printf(“%d ”,res);  
   }  
   main()  
   {  
   dosomething(56);  
   dosomething(64);  
   dosomething(127);  
   }
7. Which of the following code runs faster?  
   a) a++;  
   b) a=a+1;  
     
   i) (a)  
   ii) (b)  
   iii) Both are same  
   iv) Either of them
8. How many zeros are there in the end of 100!
9. The program is to print all the numbers in the array. Find the errors:  
   #include<stdio.h>  
   main()  
   {  
   int a[5]={10,20,30,40,50};  
   do  
   {  
   printf(“%d ”,\*a+i);  
   i++;  
   }while(i<=5);  
   }  
     
   Options: (Select all that apply)  
   a) Condition in while should be i<5  
   b) There should not be semicolon after while  
   c) printf should be \*(a+i)  
   d) i should be declared  
   e) i should be declared and initailized
10. Find the output:  
    int fun(int num)  
    {  
    if(num<3)  
    return 3:  
    return num+fun(num-2);  
    }  
    main()  
    {  
    int x=fun(12);  
    int y=fun(13);  
    printf(“%d %d”,x,y);  
    }
11. What is the maximum number of vertices in a complete binary search tree of height ‘h’.
12. Find the output of the following code:  
    int foo(int i)  
    {  
    static int sum=0;  
    if(i==5)  
    {  
    return sum;  
    }  
    else  
    {  
    sum+=i;  
    i++;  
    return foo(i);  
    }  
    }  
    main()  
    {  
    int x=foo(3);  
    int y=foo(1);  
    printf(“%d %d”,y,x);  
    }
13. What is the data structure that has O(log n)complexity on averaging for the operations: search, insert, delete.
14. Which of the following data structure has faster sequential reading:  
    i) vector  
    ii) Singly linked list  
    iii) Doubly linked list
15. Which of the following code executes faster?  
    a) for(i=0;i<MAX;++i)  
     for(j=0;j<MAX;++j)  
     printf(“%d”,arr[i][j]);  
      
    b) for(j=0;j<MAX;++j)  
     for(i=0;i<MAX;++i)  
     printf(“%d”,arr[i][j]);  
    i) (a)  
    ii) (b)  
    iii) Both are same

iv) Both are almost same on RISC processors

Round 2:

1. Write a function that converts the string in binary (base 2) from to base 4 form.  
   Example: The string “00011011” should be converted to “0123”  
   Use the function prototype.  
   void base2ToBase4(char \*str);
2. Write a program to print each level of a binary search tree in separate line. Print a space between nodes in the same level.  
   Example:  
   For the tree  
    1  
    / \  
    2 3  
    / \ \  
    4 5 7  
    /\  
    8 9  
   The output should be:  
   1  
   2 3  
   4 5 7  
   8 9