Practice Questions

Data Types. Operators. Selection and Repetition Statements.

Assume the character code used is ASCII.

1. What are the values and types of the following expressions?
   a) Assume float x = 10.0; int y = 4;
      1/2*x+20%3*(x=y)/16

   b) Assume float x = 4.5; int a = 16; float y = 4.7;
      x+a%3*(int)(x+y)%2/4

   c) Assume int a = 20; int b = 31; float x = 3.5; float y = 12.5;
      (float)(a+b)/2+(int)x%(int)y

   d) 4.5 + 3/2; (4.5 + 4)/2; (float) (2+1)/2; (float) (5/2);

   e) 'x' - 2 * 3 % 5 /100 >= '\0';
   NOTE: '\0' is the null character. Its integer value is 0.

   f) Assume double x = - 1.5;
      !(x – 2 – 5 < 0); !x – 2 – 5 < 0;

   g) 7 > 5 && !(3>9); 5.8 < 10 || 5.8 > 2;

   h) Assume int i=3;
      '3' – 4 > 0 || ++i;
      What is the value of i now?

   i) Assume int j=0;
      ++j &&(j += 4); What is the value of j now ?

   j) Assume int j=0;
      j++ &&(j += 4); What is the value of j now ?

k) Assume int n=6; int m=7;
(m == n) ? 4: 5; (m=n) ? -5:8.6; Specify the value only

l) Assume float x=2.0; float y=1.0;
x= (x>y) ? (y + 2) : y++; Specify only the values of x and y.

2. What is the error in the code? (syntax error, logic error or other run-time error)

a)
```
#include <stdio.h>
int main(void){
        i=6;
        printf("%d", i);
        return 0;
}
```

b)
```
#include <stdio.h>
int main(void){
        int i=0;
        while (i <10)
        {
                printf("%d", i);
        }
        return 0;
}
```

c)
```
#include <stdio.h>
int main(void){
        int i;
        while (i <10)
        {
                printf("%d", i); i++;
        }
        return 0;
}
```

d)
```
#include <stdio.h>
int main(void){
        int i;
        for (i=0;i <5;);
```

```
        {
                printf("%d", i);
        }
        return 0;
}
```

e)
```
#include <stdio.h>
int main(void){
        int i;
        for (i=0;i <5;);
        {
                printf("%d", i); i++;
        }
        return 0;
}
```

f) This program is supposed to output sgn(x-y), where sgn(z) is 0 if z=0; 1 if z>0 and -1 if z<0.

```
#include <stdio.h>
int main(void){
        int x,y;
        scanf("%d%d", &x, &y);
        if (x=y)
                printf("sgn(x-y)=0\n");
        else if (x>y)
                printf("sgn(x-y)=1\n");
        else
                printf("sgn(x-y)=-1\n");
        return 0;
}
```

g) Assume that the input value n is positive.
```
#include <stdio.h>
int main(void){
        int n;
        scanf("%d", &n);
        switch( n % 3)
        {
```

```
            case 0:
                printf("n is a multiple of 3\n");
            case 1:
                printf("n-1 is a multiple of 3\n"); break;
            default:
                printf("n-2 is a multiple of 3\n");
        }
        return 0;
    }
```

h)
```
#include <stdio.h>
int main(void){
        int i=0;
        while ( i < 4 ){
                if( i == 1)
                    continue;
                printf("%d\n", i);
                i++;
        }
        printf("**%d\n", i);
        return 0;
 }
```

3. What is the output?

a)
```
#include <stdio.h>
int main(void)
{
        int i,j,m,n;
        i = 100; j = 102;
        m = ++i; n = j++;
        printf("%d, %d, %d, %d\n", i,j,m,n);
        return 0;
}
```

b)
```
#include <stdio.h>
int main(void){
        int i=1, j=2;
```

```
        while (++i <5)
                j *= i;
        printf("%d, %d\n", i,j);
        return 0;
}
```

c)
```
#include <stdio.h>
int main(void){
        int i=10, j=1;
        while (++i <5)
                j *= i;
        printf("%d, %d\n", i,j);
        return 0;
}
```

d)
```
#include <stdio.h>
int main(void){
        int i=1, j=2;
        do{
        j *= i;
        }
        while (i ++<5);
        printf("%d, %d\n", i,j);
        return 0;
}
```

e)
```
#include <stdio.h>
int main(void){
        int i=10, j=1;
        do{
        j *= i;
        }
        while (i ++<5)
        printf("%d, %d\n", i,j);
        return 0;
}
```

f) Assume that ASCII is used.

```
#include <stdio.h>
int main(void)
{
        char c1, c2;
        c1 = 97;
        c2 = 98;
        printf("%c, %c\n", c1, c2);
        return 0;
}
```

g) Assume that ASCII is used.

```
#include <stdio.h>
int main(void)
{
        int c1, c2;
        c1 = 97;
        c2 = 98;
        printf("%c %c\n", c1, c2);
        return 0;
}
```

h)

```
#include <stdio.h>
int main(void){
        int i=10;
        while (1){
                if( i%3 == 0)
                    break;
                printf(“*%d\n”, i);
                i--;
        }
        printf(“**%d\n”, i);
        return 0;
}
```

i)
```
#include <stdio.h>
int main(void){
    int i=10;
    while (i>0){
        i--;
        if( i%3 != 0)
            continue;
        printf("*%d\n", i);
        i--;
    }
    printf("**%d\n", i);
    return 0;
}
```

j)
```
#include <stdio.h>
int main(void){
    int i,j;
    for (i=0; i<6; i++){
        for ( j=0; j<2*i; j++ ){
            if( j%2 == 1)
                break;
            printf("+");
        }
        printf("\n");
    }
    printf("%d,%d\n",i, j);
    return 0;
}
```

k)
```
#include <stdio.h>
int main(void){
    int i,j;
    for (i=0; i<6; i++){
        for ( j=0; j<2*i; j++ ){
            if( j%2 == 1)
                continue;
            printf("+");
        }
```

```
            printf("\n");
        }
        printf("%d,%d\n",i, j);
        return 0;
    }
```

l)
```
#include <stdio.h>
int main(void){
        int letter,  count1=0,  count2=0,  count3=0;
        printf("Enter your text followed by '!' to end input\n");
        while( (letter = getchar()) != '!'){
          switch( letter )
         {
            case 'T':
            case 't':
               count1++; break;
            case 'S':
            case 's':
               count2++; break;
            default:
               if( (letter >= 65 && letter <= 90) || (letter >= 97 && letter <= 122))
                    count3++;
            }// end switch
        }
        printf("Letters T or t occur %d times.\n", count1);
        printf("Letters S or s occur %d times.\n", count2);
        printf("The remaining letter occurrences are %d.\n", count3);
        return 0;
}
```

Assume that the input text is:

ASCII Character Set!

m)
```
#include <stdio.h>
int main(void){
        int i,j;
        for (i=0, j=0; i<2,j<4; i++,j++){
                printf("*");
        }
        printf("\n%d,%d\n",i, j);
        return 0;
}
```