Programming C & Data Structure

Programming C

Q.1 Consider the following program.

```
#include<stdio.h>
void main()
{
        int a=1,b=-1,c=0,d;
        d=--a || b++ && c++;
        printf("%d%d%d%d",a,b,c,d);
}
```

The output is_____

Q.2 What will be the output of the C program?

```
#include<stdio.h>
int main()
{
    int a = 2, b = 2, c = 0, d = 2, m;
    m = a++ && b++ && c++ || d++;
    printf("%d %d %d %d %d",a, b, c, d, m);
    return 0;
}
```

(A) Compilation error
(B) 3 3 1 3 1
(C) 3 3 1 3 0
(D) some garbage value

Q.3 Consider the following program.

```
#include<stdio.h>
void main()
{
        int a;
        a= 120 > 50 ? printf("GATE") && printf("CSE")||printf("pankaj"):printf("neeraj");
        printf("%d",a);
}
```

The output is_____

Q.4 Which combination of the integer variables x, y and z makes the variable a get the value 4 in the following expression?

```
a = ( x > y ) ? (( x > z ) ? x : z) : (( y > z ) ? y : z )
```

(A) x = 3, y = 4, z = 2 (B) x = 6, y = 5, z = 3

(C) x = 6, y = 3, z = 5 (D) x = 5, y = 4, z = 5

Q.5 Consider the following program.

```
#include<stdio.h>
void main()
{
        int a=4,b=5,c=6,d=7;
        inte
        e=++a && ++b || --c && ++d ;
        printf("%d%d%d%d%d",a,b,c,d,e);
}
```

The output is_____

Q.6 What will be the output of the C program?

```
#include<stdio.h>
int main()
{
    int a = 1, b = 3, c;
    c = b <<  a;
    b = c * (b * (++a)--);
    a = a >> b;
    printf("%d",b);
    return 0;
}
```

(A) 36 (B) Compilation error (C) 30 (D) 24

Q.7 Consider the following C code. Assume that unsigned long int type length is 64 bits.

```
unsigned long  int  fun (unsigned  long  int  n)
{
    unsigned  long  int  i, j = 0, sum  = 0;
    for( i = n; i > 1; i = i/2) j++;
    for  (; j > l; j = j/2)    sum  ++;
    return (sum);
}
```

The value returned when we call fun with the input 2^{40} is

(A) 4 (B) 5 (C) 6 (D) 40

Q.8 Consider the C program fragment below which is meant to divide x by y using repeated subtraction. The variable x, y, q and r are all unsigned int.

```
while (r > = y)
{
    r = r –y;
    q =q +1;
}
```

Which of the following conditions on the variables x, y, q and r before the execution of the fragment will ensure that the loop terminates in a state satisfying the condition x = = (y*q + r)?

(A) (q = = r)&&(r = = 0)

(B) (x > 0)&&(r = = x)&&(y > 0)

(C) (q = = 0)&&(r = = x)&&(y > 0)

(D) (q == 0) && (y > 0)

Q.9 The following C function takes two ASCII strings and determines whether one is an anagram of the other. An anagram of a string obtained by permuting the letters in s.

```
int anagram (char*a, char*b)
{
    int count [128], j;
    for (j=0; j<128;j++)count[j]= 0;
    j = 0;
    while (a[j] && b[j])
    {
        A;
        B;
        }
    for (j = 0; j < 128; j ++)
        if (count [j]) return 0;
    return 1;
}
```

Chose the correct alternative for statements A and B.

(A)
```
A: count [a[j]]++and
B : count [b[j]]--
```

(B)
```
A: count [a[j]]++and
B : count [b[j]]++
```

(C)
```
A: count [a[j++]]++and
B : count [b[j]]--
```

(D)
```
A: count [a[j]]++and
B : count [b[j++]]--
```

Q.10 Consider the following pseudo code. What is the total number of multiplication to be performed?

```
D = 2
for i = 1 to n do
for j = i to n do
for k = j+1 to n do
D = D * 3
```

(A) Half of the product of the 3 consecutive integers

(B) One-third of the product of the 3 consecutive integers.

(C) One-sixth of the product of the 3 consecutive integers.

(D) None of the above.

(1)
```
#include <stdio.h>
void main()
{
    int a=1, b=-1, c=0, d;
    d = --a || b++ && c++;
    printf("%d %d %d %d", a, b, c, d);
}
```

Output:

a = 1 , --a = 0
b = -1 , b++ = 0
c = 0 , c++ = 1
d = 0

Output = 0010

(2)
```
#include <stdio.h>
int main()
{
    int a=2, b=2, c=0, d=2, m;
    m = a++ && b++ && c++ || d++;
    printf("%d %d %d %d %d", a, b, c, d, m);
    return 0;
}
```

Output ⇒ 3 3 1 3 1

(3) ⇒

```
#include <stdio.h>
vaid main()
{
    int a;
    a = 120 > 50 ? printf("GATE") && printf("CSE") || printf("pankaj"):
        printf("neeraj");

    printf("%d", a);
}
```

Output :—

GATECSE 1

(4) ⇒

x = 3
y = 4
z = 2

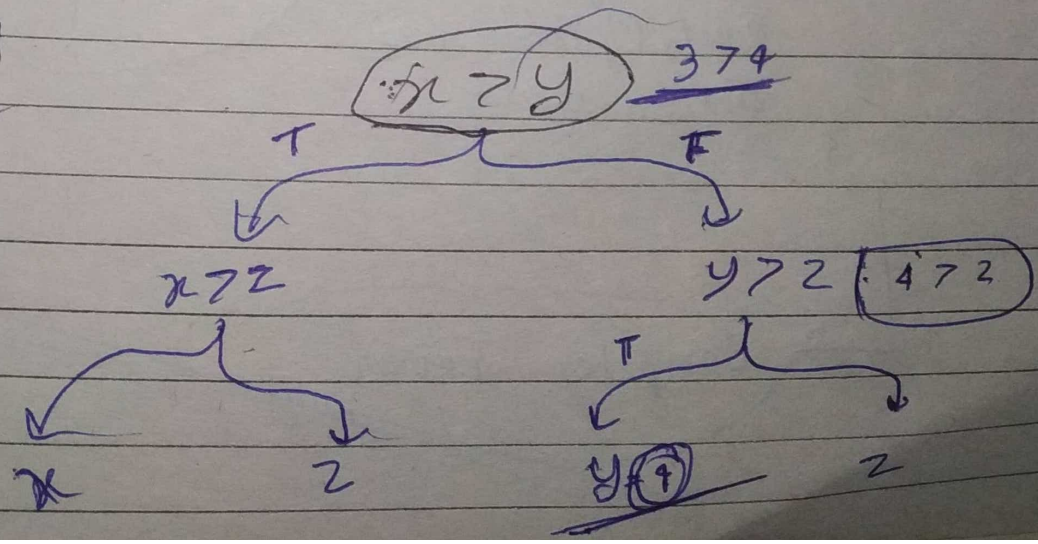
A

$a = (x>y) ? ((x>z) ? x : z) : ((y>z) ? y : z)$

a = 4

x, y, z = ?

Sol



(5) ⇒

```
#include<stdio.h>
void main()
{
    int a = 4, b=5, c=6, d=7;
    int e;
    e = ++a && ++b || --c && ++d;
    printf("%d %d %d %d %d", a, b, c, d, e);
}
```

Output :-

→ ~~5658~~ 56671 Ans

(6) ⇒

```
#include<stdio.h>
int main()
{
    int a=1, b=3, c;
    c = b<<a;
    b = c*(b*(++a)--);
    a = a>>b;
    printf("%d", b);
    return 0;
}
```

c = 3 << 1

b = Error

Compile Error

(7) unsigned long int fun(unsigned long int n)
{
unsigned long int i, j, =0, sum=0;
for(i=n; i>1; i=i/2) j++;
for(; j>1; j=j/2) sum++;
return(sum);
}

Output for $n = 2^{40}$

→ 5 Ans

(8) while (n>=4)
{
n = n-4;
q = q+1;
}

Satisfy
$(n == 4*q + r)$

$(n>0) \&\& (n == x) \&\& (4>0)$

Ans

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```
int anagram(char *a, char *b)
{
    int count[128] = {0}, j;
    for (j=0; j<128; j++)
        count[j] = 0;
    j=0;

    while (a[j] && b[j])
    {
        A; B;
    }
    for (j=0; j<128; j++)
        if (count[j])
            return 0;
    return 1;
}
```

A && B = {

→ A = count[a[j++]]++
B = count[b[j]]--

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D

```
D = 2
for i=1 to n do
for j = i to n do
for k = j+1 to n do
    D = D * j
```

i=1
j=1
k=2
D = 15

None