

## Subject: Programming in C

## Topic: Iterative Statements



DPP-02

[NAT]

1. Consider the following program:

```
#include<stdio.h>

int main()
{
    int i=3;
    for(;i++<=9;++i);
    printf("%d",i);
    return 0;
}
```

The output is \_\_\_\_\_.

[NAT]

2. Consider the following program:

```
#include<stdio.h>
int main()
{
    int i=3;
    for(;i++<=9;++i)
    {
        printf("best hai GATE Wallah");
        if(i>8) break;
    }
    return 0;
}
```

The number of times printf() executed is \_\_\_\_\_

[MCQ]

3. Consider the following program:

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

}

The output sequence is-

- (a) 0 1 2 3 4      (b) 0 1 2 3  
(c) 1 2 3 4      (d) 1 2 3 4 5

[MCQ]

4. Consider the following program:

```
#include<stdio.h>
int main()
{
    int i=0;
    for(i=2; i<=n; i*=2)
    printf("GATE WALLAH 2024");
    return 0;
}
```

The number of times printf() executed is approximated as-

- (a)  $2^n$       (b)  $\log_2 n$   
(c)  $\log_2 \log_2 n$       (d) 2

[MCQ]

5. Consider the following program:

```
#include <stdio.h>
int main()
{
    int i;
    for(i=printf("GATE");i<printf("Wallah2023");)
    {
        if(i%2==0) i=i-1;
        else i=i+2;
    }
    return 0;
}
```

The number of times "Wallah2023" is printed is-

- (a) 4      (b) 5  
(c) 6      (d) 7

**[MCQ]**

6. Consider the following program:

```
#include <stdio.h>
int main()
{
    int i, j, n;
    for(i=1;i<=n;i++)
    for(j=1;j<=n;j++)
    printf("GATE Wallah");
    return 0;
}
```

How many times will the printf() statement be executed when n=32?

- (a) 128                      (b) 1024  
(c) 512                      (d) 256

**[NAT]**

7. Consider the following program:

```
#include <stdio.h>
int main()
{
    int i, j, n, count=0;
    for(i=1;i<=n;i++)
    for(j=1;j<=i;j++)
    count+=1;
}
```

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

When n=31, the output is \_\_\_\_\_

**[MCQ]**

8. Consider the following program:

```
#include <stdio.h>
int main()
{
    int a,i;
    a= 12.5/5+31.2/2*5-5;
    for(i=a; i<90;i=i+3)
    {
        printf("%c\t", i+32);
    }
    return 0;
}
```

The output is-

- (a) 107 110 113 116 119  
(b) K L M N O  
(c) k n q t w  
(d) Garbage values

## Answer Key

- |         |          |
|---------|----------|
| 1. (12) | 6. (b)   |
| 2. (4)  | 7. (496) |
| 3. (d)  | 8. (c)   |
| 4. (b)  |          |
| 5. (c)  |          |



## Hints and solutions

### 1. (12)

3<=9 TRUE. i is incremented to 4. Loop is executed.  
 ++i is executed. i takes value 5.  
 5<=9 TRUE. i is incremented to 6. Loop is executed.  
 ++i is executed. i takes value 7.  
 7<=9 TRUE. i is incremented to 8. Loop is executed.  
 ++i is executed. i takes value 9.  
 9<=9 TRUE. i is incremented to 10. Loop is executed.  
 ++i is executed. i takes value 11.  
 11<=9 FALSE. i is incremented to 12. Loop is not executed.

Final value of i= 12.

### 2. (4)

3<=9 TRUE. i is incremented to 4 as i++ was used.  
 printf() executed.  
 (i>8) false;  
 ++i is executed. i takes value 5.  
 5<=9 TRUE. i is incremented to 6 as i++ was used.  
 printf() executed.  
 (i>8) false;  
 ++i is executed. i takes value 7.  
 7<=9 TRUE. i is incremented to 8 as i++ was used.  
 printf() executed.  
 (i>8) false;  
 ++i is executed. i takes value 9.  
 9<=9 TRUE. i is incremented to 10 as i++ was used.  
 printf() executed.  
 (i>8) True; So, it breaks out from the loop.

Therefore, printf() is executed 4 times.

### 3. (d)

Condition of for loop: b

1-> TRUE; b=a++<=3 is executed; b=0<=3-> TRUE;  
 b=1, a is incremented to 1.  
 1 is printed.  
 1-> TRUE; b=a++<=3 is executed; b=1<=3-> TRUE;  
 b=1, a is incremented to 2.  
 2 is printed.  
 1-> TRUE; b=a++<=3 is executed; b=2<=3-> TRUE;  
 b=1, a is incremented to 3.

3 is printed.

1-> TRUE; b=a++<=3 is executed; b=3<=3-> TRUE;  
 b=1, a is incremented to 4.

4 is printed.

1-> TRUE; b=a++<=3 is executed; b=4<=3-> FALSE; b=0, a is incremented to 5.

5 is printed.

0->FALSE; Loop terminates.

Output: 1 2 3 4 5

### 4. (b)

The for loop runs for i values- 2, 2<sup>2</sup>, 2<sup>3</sup>... 2<sup>k</sup>

The loop terminates when 2<sup>k+1</sup>>n

k = log<sub>2</sub>n

### 5. (c)

i = printf ("GATE"); // i is initialized to 4

i < printf ("Wallah2023"); // i < 10

↳ printf () executed

i 43779

i takes values→

(4 % 2) == 0 → i = i - 1 ⇒ i = 3

3 < 10 → printf() executed

(3%2)! = 0 → i = i + 2 = 3 + 2 = 5

5 < 10 → printf () executed

(5 % 2)! = 0 → i = 7

7 < 10 → printf () executed

(7%2)! = 0 → i = 9

9 < 10 → printf () executed

(9%2)! = 0 → i = 11

$11 < 10 \rightarrow \text{printf}()$  executed but loop terminates as condition is false.

$\therefore$  "Wallah2023" is printed 6 times.

6. (b)

The given nested loops are independent.

The loop will run  $(n*n)$  times.

$\therefore$  The printf() statement is executed for  $(32*32) = 1024$  times when  $n = 32$ .

7. (496)

The given nested loops are dependent loops.

|       |   |       |         |      |                 |
|-------|---|-------|---------|------|-----------------|
| i     | 1 | 2     | 3       | .... | n               |
| j     | 1 | 1, 2  | 1, 2, 3 |      | 1, 2, 3, ..., n |
| Count | 1 | (1+2) | (1+2+3) |      | (1+2+3+... n)   |

The final value of count is–

$\Rightarrow (1 + 2 + 3 + \dots n)$

$\Rightarrow (1 + 2 + 3 + \dots + 31)$  when  $n = 31$

$$\Rightarrow \frac{31 \times 32}{2}$$

$\Rightarrow 496$

8. (c)

$a = 12.5/5 + 31.2/2 * 5 - 5$

$a = 75.5$

$\therefore a$  is integer

$\therefore a = 75$

The for loop converts each character to lower case corresponding to the ASCII values.

Output ASCII :  $(75 + 32) (78 + 32) \dots (87 + 32)$

Output characters : k n q t w



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