CSE/IT
Batch: Hinglish

C Programming
Control Flow Statement

DPP-02

[NAT]

1. Consider the following program:

```c
#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:

```c
#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:

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

```c
}
```

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:

```c
#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:

```c
#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)
2. (4)
3. (d)
4. (b)
5. (c)

6. (b)
7. (496)
8. (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- $2, 2^2, 2^3 \ldots 2^k$

The loop terminates when $2^{k+1}>n$

$k = \log_2 n$

5. **(c)**
i = printf ("GATE"); // i is initialized to 4

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

$\quad\quad\quad \hookrightarrow$ printf () executed

i $\boxed{4\,3\,5\,7}$ 9

i takes values→

$(4 \% 2) = = 0 \rightarrow i = i - 1 \Rightarrow i = 3$

$3 < 10 \rightarrow$ printf() executed

$(3 \% 2)! = 0 \rightarrow i = i + 2 = 3 + 2 = 5$

$5 < 10 \rightarrow$ printf () executed

$(5 \% 2)! = 0 \rightarrow i = 7$

$7 < 10 \rightarrow$ printf () executed

$(7 \% 2) ! = 0 \rightarrow i = 9$

$9 < 10 \rightarrow$ printf () executed

$(9 \% 2)! = 0 \rightarrow i = 11$

$11 < 10 \rightarrow$ 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–

$\Rightarrow (1 + 2 + 3 + ….. \text{ n})$

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

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

$\Rightarrow 496$

8. (c)

a = 12.5/5 + 31.2/2 * 5 – 5

a = 75.5

$\because$ 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) ……. (87 + 32)

Output characters : k n q t w