

Subject: Programming in C

Chapter : Control Flow Statements

Topic: Iterative Statements (Loops-2)

DPP-03

[NAT]

```
1. #include <stdio.h>

int main()
{
    int a=7, b=8;
    while(++b & a-- )
    {
        printf("HI!");
    }
    return 0;
}
```

The number of times the printf() executed is _____.

[MCQ]

```
2. #include <stdio.h>

int main()
{
    int a=5, b=10;
    while(++b & a-- )
    {
        switch (b)
        {
            case 0: b=b-1;
            break;
            case 1: b=b-2;
            break;
            default: b=b-3;
            break;
        }
    }
```

```
}

printf("%d\t%d", a, b);

return 0;

}
```

The output is-

- | | |
|----------|---------|
| (a) 4 8 | (b) 3 9 |
| (c) 3 10 | (d) 4 6 |

[MCQ]

```
3. int main()
{
    int a=1, b=2;
    do
    {
        while(b++)
        {
            b=b-a;
            a=a+b;
        }
    }
    while(a++<2);
    printf("%d\t%d", a, b);
    return 0;
}
```

The output is-

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

[MCQ]

4. #include <stdio.h>

```
int main()
{
    int a,b;

    a=printf("GATE")>printf("Wallah"?printf("2023"):p
rintf("Hi!!");

    b=a-1;

    while(a>b)
    {
        switch(b)
        {
            case 1: b=--a;
            case 2:b=a--;
            default:b=--a;
        }
    }
    printf("%d%d", a, b);
    return 0;
}
```

The output string is-

- (a) GATEWallahHi!!33
- (b) GATEWallah202303
- (c) GATEWallah202330
- (d) GATEWallahHi!!00

[NAT]

5. #include <stdio.h>

```
int main()
{
    int i=16;

    do
    {
        i=i-2;
```

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

The sum of all printed values of i is ____?

[MCQ]

6. #include <stdio.h>

```
int main()
{
    int a, b;
    while(a!=b)
    {
        a=a/2;
        b=b*2;
        if(b>a) break;
    }
    return 0;
}
```

If $a = 2^m$ and $b = 2^n$ where $m-n$ is even and positive, the number of times the loop runs is-

- (a) $\frac{m-n}{2}$
- (b) $\left\lceil \frac{m-n}{2} \right\rceil + 1$
- (c) $\frac{n-m}{2}$
- (d) $\left\lceil \frac{n-m}{2} \right\rceil + 1$

[NAT]

7. #include <stdio.h>

```
int main()
{
    int x=5, y=10;
    if(printf("GATE")-3){
        while(x--) y=y+x;
    }
    else y=y-x;
```

```

return 0;
}

```

The value of y at the end of the program is _____.

[NAT]

8. #include <stdio.h>

```

int main()
{

```

```

{

```

```

    int x=5, y=5;

```

```

while(x-=y++<10){

```

```

    printf("GATE WALLAH\n");

```

```

}

```

```

return 0;

```

```

}

```

The number of times "GATE WALLAH" printed is _____.



Answer Key

1. (7)
2. (b)
3. (d)
4. (a)
5. (105)

6. (a)
7. (20)
8. (4)

Hints and solutions

1. (7)

$a = 7 = 0111$ a $\overline{1\ 0\ 1\ 1\ 0\ 1\ 0}$
 $b = 8 = 1000$ b $\overline{1\ 0\ 0\ 0\ 1\ 0\ 1\ 0}$ $1\ 4\ 1\ 5$
 while (++b & a --)

$9 \& 7 \rightarrow \text{true}$ $\begin{array}{r} 1001 \\ 0111 \\ \hline 0001 \end{array}$
 printf \rightarrow executed
 $10 \& 6 \rightarrow \text{True.}$ $\begin{array}{r} 1010 \\ 0110 \\ \hline 0010 \end{array}$
 printf \rightarrow executed ;

similar explanation –

\therefore printf() is executed –
 for $a = 7, 6, 5, 4, 3, 2, 1 \rightarrow$ Total 7 times

2. (b)

a $\overline{1\ 0\ 1\ 1\ 0}$ b $\overline{1\ 0\ 1\ 1\ 0}$ $3\ 5$
 while (++b & a --)

$11 \& 5 \rightarrow \text{true}$
 switch (11)
 default: $b = 11 - 3$
 $9 \& 4 \rightarrow \text{false}$

\therefore Final values of a and b are –

$\boxed{3\ 9}$

3. (d)

a $\overline{1\ 0\ 1\ 1\ 0}$ b $\overline{1\ 0\ 1\ 1\ 0}$ $4\ 1$
 do
 {
 While (b++)
 {
 // values assigned are 2, 2, 0
 $b = b - a = 3 - 1 = 2$ // $3 - 3 = 0$
 $a = a + b = 1 + 2 = 3$ // $3 + 0 = 3$
 }
 }

while (a ++ < 2);

$3 < 2 \rightarrow \text{false}$

final values are –

$\frac{a}{4} \mid \frac{b}{1}$

4. (a)

$a = \text{printf}("GATE") > \text{printf}("Wallah") ? \text{printf}("2023") : \text{printf}("Hi!!");$
 \downarrow $4 > 6 \rightarrow \text{False}$

$a = 4$; Output:

$b = a - 1$; // $b = 3$

GATEWallahHi!!33

while (a > b){

$4 > 3$

$3 > 3 \rightarrow \text{false}$

switch (b){
 3

case 1 : $b = -- a$;

case 2 : $b = a --$;

a $\overline{4\ 3}$

default : $b = -- a$;

b $\overline{3\ 3}$

}

}

5. (105)

Do

{

$i = i - 2$;

printf("%d",j); //14 13 0

}

while (i ++);

14
13

·
·
·

0 → stop.

Value printed–

14 13 12 11 1 0

Sum of the values–

$$\Rightarrow \frac{14 \times (14 + 1)}{2}$$

$$\Rightarrow 105$$

6. (a)

a = 1024; b = 64

while (a != b)

{

1024 != 64 → True

256 != 256 → False

a = a/2; //a = 512, 256

b = b * 2; //b = 128, 256

if (b > a) break;

}

∴ The loop runs for 2 times $\left(\because \frac{10 - 6}{2} = 2 \right)$

7. (20)

printf() prints and returns the number of characters it successfully printed. So, the condition becomes (4-3) i.e 1 which is TRUE.

So, the while loop is executed for x values= 5, 4, 3, 2, 1

$$y = 10 + 4 + 3 + 2 + 1 + 0 = 20$$

8. (4)

x = y++ < 10 will make the condition true for x = 4, 3, 2, 1 and y = 5, 6, 7, 8.

Hence, printf() will be executed 4 times.



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