

# CS & IT ENGINEERING

Control flow statements

Programming in C

Iterative statements

DPP 02 Discussion Notes



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## TOPICS TO BE COVERED

01 Question

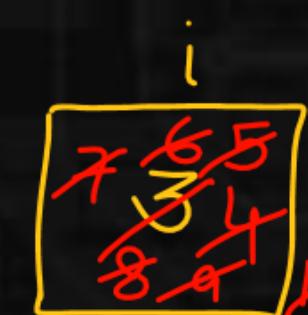
02 Discussion

Q.1

Consider the following program:

```
#include<stdio.h>
int main()
{
    int i=3;
    for(;i++<=9;++);
    printf("%d",i);
    return 0;
}
```

The output is 12.



for(

)  
*i* {  
*i*  $i++ \leq 9$ ;  $i++$   
 ; }  
 ;

- (i)  $3 \leq 9 \rightarrow \text{True}$   
 $5 \leq 9 \rightarrow \text{True}$   
 $7 \leq 9 \rightarrow \text{True}$   
 $9 \leq 9 \rightarrow \text{True}$

}

$11 \leq 9 \rightarrow \text{False}$

[NAT]

(i) use the value  
 (ii) After that inc.  
 the value by  
 1

Q.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 4

i  
~~5 3 6~~ 7 8 9  
10  
bf → खरब 4 [NAT]

for( ; i++<=9; ++i)

①    3 <= 9 → True {  
      5 <= 9 → True  
      7 <= 9 → True  
      9 <= 9 → True

}

i=4, 6, 8, 10

**Q.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

O/P: 1 2 3 4 5

B.

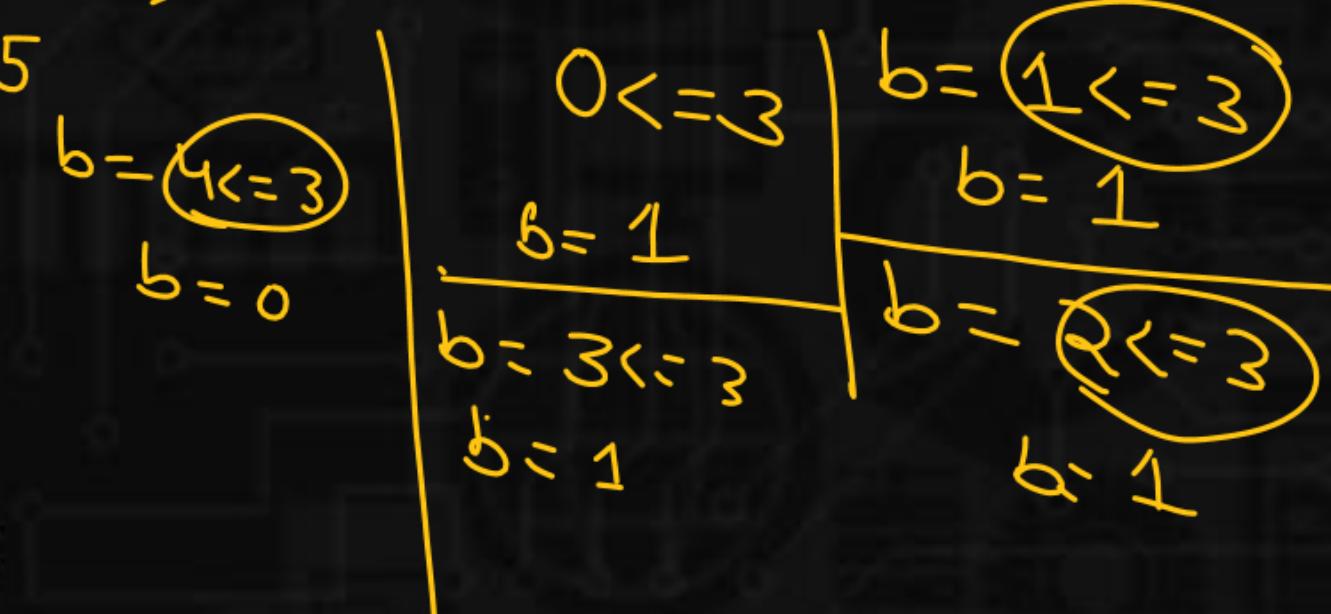
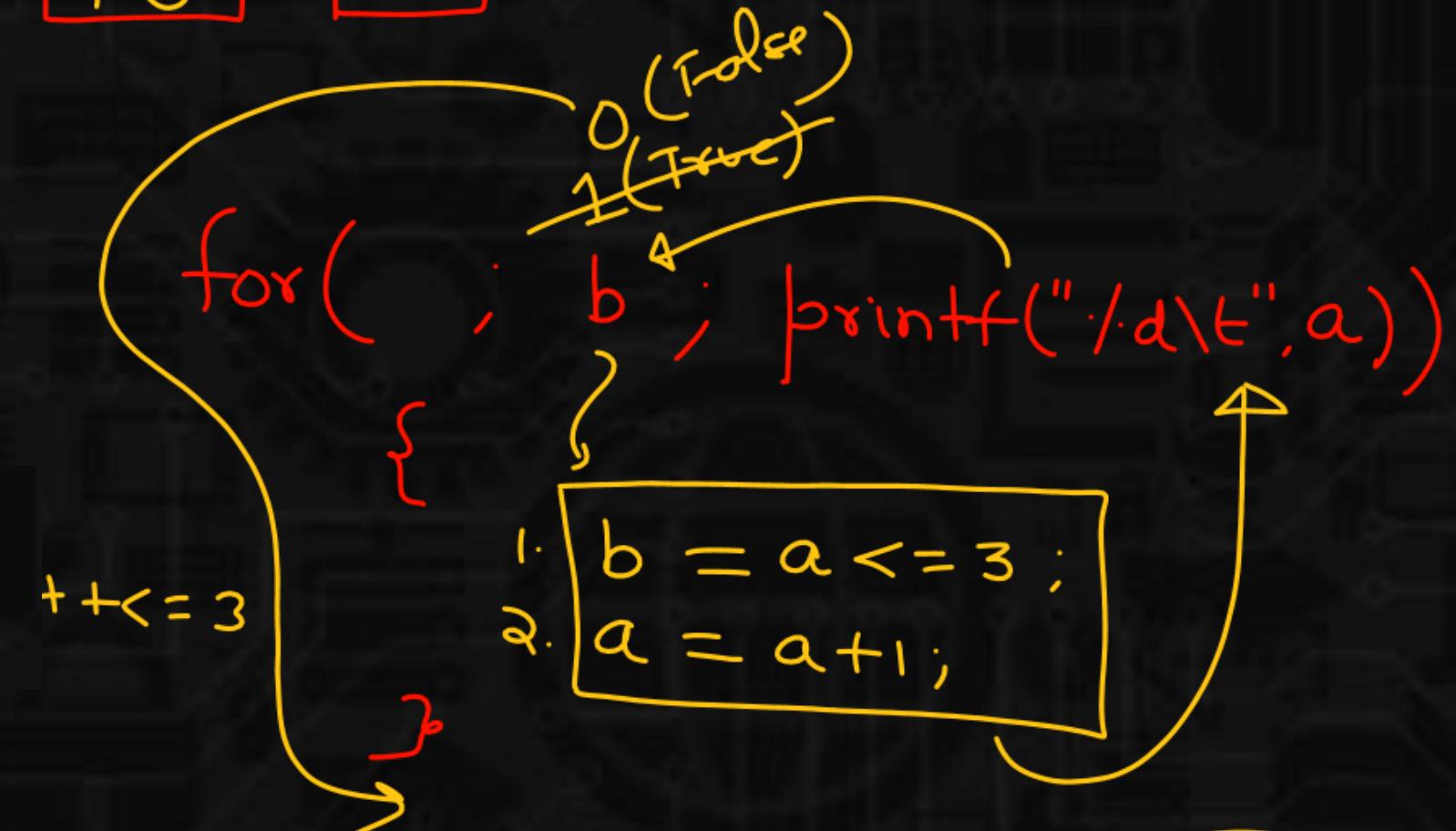
0 1 2 3

D.

C. 1 2 3 4



**[MCQ]**



**Q.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;
}
```

$$\log_2 100 \rightarrow 6$$

(B)

i
2

n = 100

**[MCQ]**P  
W

i = 2, 2 &lt;= 100 → True ✓

i = 4, 4 &lt;= 100 → True ✓

i = 8, 8 &lt;= 100 → True ✓

i = 16, 16 &lt;= 100 → True ✓

i = 32, 32 &lt;= 100 → True ✓

i = 64, 64 &lt;= 100 → True ✓

i = 128, 128 &lt;= 100 → False

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

A.

 $2^n$ 

C.

 $\log_2 \log_2 n$ 

B.

 $\log_2 n$ 

D.

2

$\Leftrightarrow \log_2(\log_2 100)$

$\Rightarrow \frac{\log_2 6}{2}$

A)  $2^{\log_2 100} \Rightarrow 6$  times

**Q.5**

Consider the following program:

```
#include <stdio.h>
int main()
{
    int i; ①
    for(i=printf("GATE");i<printf("Wallah2023");)
    {
        ③ if(i%2==0) i=i-1;
        else i=i+2;
    }
    return 0;
} ⑤
```

(C) ⑥

The number of times "Wallah2023" is printed is-

A.

4

B.

5

C.

6

D.

7



**[MCQ]**

P  
W

$$4 < 10 \rightarrow \text{True}$$

$$4 \% 2 == 0$$

$$0 == 0 \rightarrow \text{True} \quad i = i - 1$$

$$3 < 10 \rightarrow \text{True}$$

$$5 < 10 \rightarrow \text{True}$$

$$7 < 10 \rightarrow \text{True}$$

$$9 < 10 \rightarrow \text{True}$$

$i < \text{printf}("Wallah2023")$

$11 < 10$

**Q.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;
```

*Code*

```
for(i=1;i<=n;i++)
```

```
{
```

$i=1 \rightarrow n$

$i=2 \rightarrow n$

$i=3 \rightarrow n$

$n$  times ← code

Code to print  
Something  
 $\Rightarrow$   $n$  times

```
for(i=1;i<=n;i++)
```

```
}  
    pf("1");
```

$\Rightarrow$   $n$  times

$$n \times n = n^2$$

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

A.

128

B.

1024

$$32 \times 32 \\ \Rightarrow 1024$$

C.

512

D.

256

**Q.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 496

$$\begin{array}{r} 16 \\ \cancel{31 \times 32} \\ \hline \cancel{186} \\ 31 \\ \hline 496 \end{array}$$

for ( $i = 1 ; i \leq n ; i++$ )  
 {  
 }  $\xrightarrow{\textcircled{1} \rightarrow \textcircled{2} \leftarrow \textcircled{4}}$

Code  
 for ( $j = 1 ; j \leq i ; j++$ )  
 {  
 |   | Count = Count + 1  
 |   | }  
 }

$i = 1 \quad | \quad i = 2 \quad | \quad i = 3 \quad | \dots \quad | \quad i = n$   
 $j = 1 \quad | \quad j = 1, 2 \quad | \quad j = 1, 2, 3 \quad | \dots \quad | \quad j = 1, 2, \dots, n$   
 ①      ②      ③      ④

$$1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$

**Q.8**

Consider the following program:

#include &lt;stdio.h&gt;

```
int main()
{
```

int a,i;

a= 12.5/5+31.2/2\*5-5; i= 81

for(i=a; i&lt;90; i=i+3)

{

printf("%c\t", i+32);

}

return 0;

}

The output is-

107 110 113 116 119 512

i= 75, 75&lt;90 → True

i= 78, 78&lt;90 → True

i= 81 81&lt;90 ✓

i= 84 84&lt;90 ✓

i= 87 87&lt;90 ✓

i= 90 90&lt;90 X

(C)

$$a = \underbrace{12.5/5}_{\text{float}} + \underbrace{31.2/2}_{\text{int}} * 5 - 5$$

$$2.5 + \underbrace{31.2/2}_{\text{float}} * 5 - 5$$

$$2.5 + \underbrace{15.6 * 5}_{\text{int}} - 5$$

$$2.5 + 78.0 - 5$$

$$80.5 - 5$$

$$\boxed{a = 75} \quad \begin{matrix} 75 \\ + 5 \end{matrix}$$

i+32 → 107

K n q t w i+32 → 110

81+32 → 113

a = 97

98

99

100

101

102

103

104

105

106

107

K

108

109

110

n

o

p

q

r

s

t

KLMNO

Garbage values

A

B

C

D

