CS & IT ENGINEERING

Control flow statements

Programming in C

Loops-2 /Iterative Statements-2

DPP 03

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01 Question

02 Discussion

Q.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 7.

1, 2, 3, 4, 5, 6, 7

[NAT]

a 7 6 5 4 3 2 1 0 -1

b 8 9 10 11 12 13 14 15 16

vii) 15 & 1 ⇒ 1111 & 0001 ⇒ 0001 ⇒ 1

16 & 0 ⇒ 10000 & 00000 ⇒ 00000 ⇒ False

(i) 9 & 7 ⇒ 1001 & 0111 ⇒ 0001 ⇒ 1

(ii) 10 & 6 ⇒ 1010 & 0110 ⇒ 0010 ⇒ 2

(iii) 11 & 5 ⇒ 1011 & 0101 ⇒ 0001 ⇒ 1

(iv) 12 & 4 ⇒ 1100 & 0100 ⇒ 0100 ⇒ 4

(v) 13 & 3 ⇒ 1101 & 0011 ⇒ 0001 ⇒ 1

(vi) 14 & 2 ⇒ 1110 & 0010 ⇒ 0010 ⇒ 2

Q.2

[MCQ]

```
#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;
    }
```

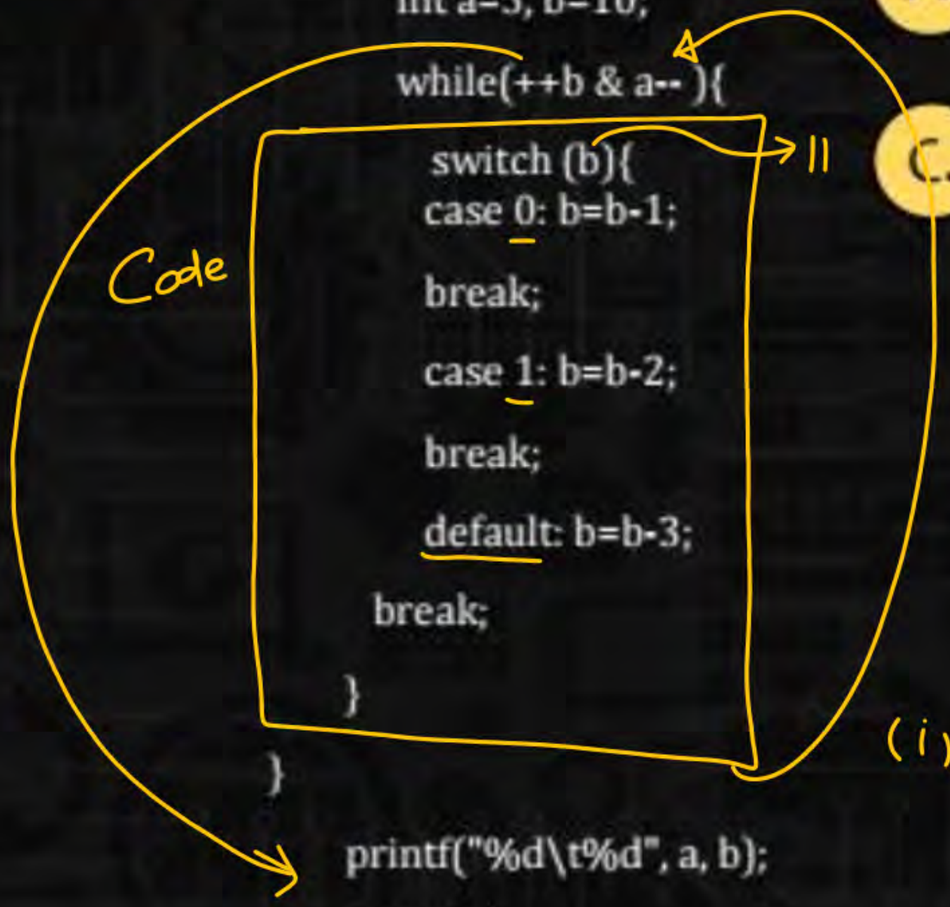
The output is-

A. 4 8

B. 3 9

C. 3 10

D. 4 6



a: ~~5~~ 4 3

b: ~~10 11~~ 8 9

(i) || & 5 ⇒ 1011 & 0101 = 0001 ⇒ 1

9 & 4 ⇒ 1001 & 0100 = 0000 ⇒ 0 False

(B)

Q.3

[MCQ]

```
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-

Code

A. 3 0

B. 4 2

C. 3 2

D. 4 1

a | 1 2 3 4

b | 2 3 2 3 0 1

D

b++ ⇒ b while(2)

while(2)

while(0)

a++<2

⇒ (i) a<2

(ii) Inc. a

Q.4

[MCQ]

```
#include <stdio.h>
int main(){
int a,b;
a=printf("GATE")>printf("Wallah")?
printf("2023"):printf("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;}
```

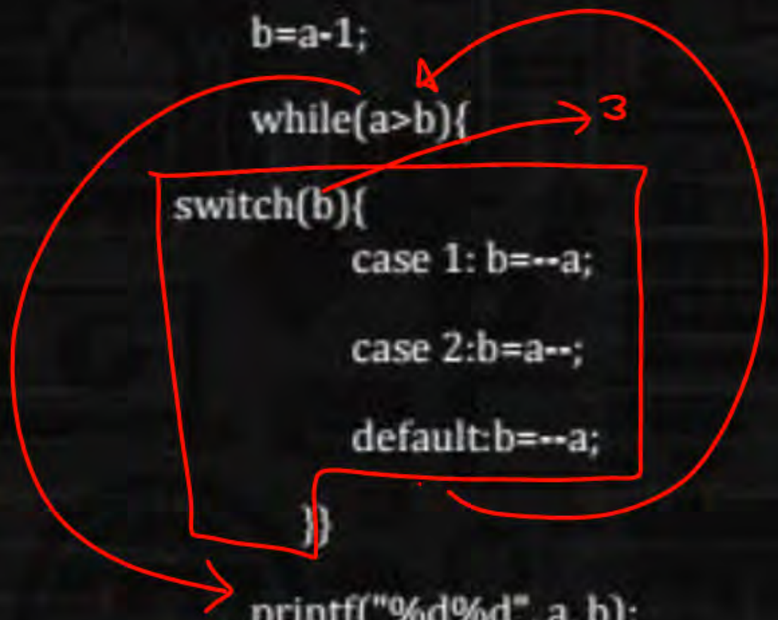
The output string is-

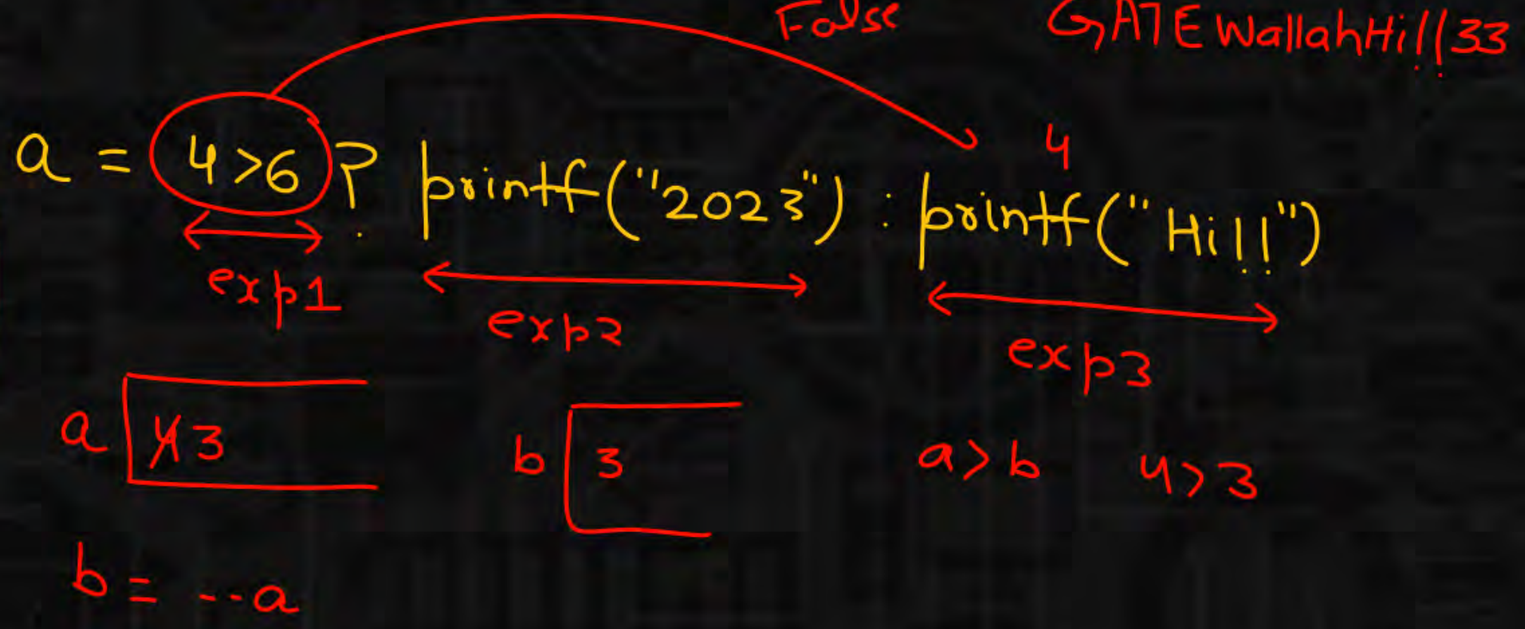
A. GATEWallahHi!!33

B. GATEWallah202303

C. GATEWallah202330

D. GATEWallahHi!!00





Q.5

[NAT]

```
#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 ___?

105

i: 16 14 15 13 14 12 13

14, 13, 12, 11

12

i ⇒ 7 3 1 X 0

i++ ⇒ 14 ⇒ True
i++ ⇒ 13 ⇒ True
i++ ⇒ 12 ⇒ True
11 → True

14, 13, 12, 11, 10, 9, ... 2, 1, 0

2 ⇒ True
1 ⇒ True
0 ⇒ False

0, 1, 2, 3, - - 14

1+2+3+ - -+14

1+2+ - n = n(n+1)/2

⇒ 14×15/2 = 7×15 = 105

Q.6

[MCQ]

```
#include <stdio.h>
    int main()
    {
        int a, b;
        while(a!=b)
        {
    (1)   a=a/2;
    2)    b=b*2;
    3)    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. $\frac{m-n}{2}$ → $\frac{10-6}{2}$

B. $\left[\frac{m-n}{2}\right]+1$

C. $\frac{n-m}{2}$ → -ve

D. $\left[\frac{n-m}{2}\right]+1$ → $[-2]+1$

$a = 2^{10}$, $b = 2^6$

10 → 9 → $2^{10} \Rightarrow 2^9$ → 2^8

10 − 6 = Even

a: 1024 512 256

b: 64 128 256 ($2^6 \rightarrow 2^7 \rightarrow 2^8$)

2 times

a > b

(i) 1024 != 64

(ii) 512 != 128

(iii) 256 != 256 False

Q.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 20

x 5 4 3 2 1 0 -1 y 10 14 17 19 20 20 [NAT]

if(4-3) ⇒ if(1) → non-zero → true

GATE

while(x--)

y=y+x;

5 4 3 2 1 0

⇒

```
while(x--)
{
y=y+x;
}
```

Q.8

[NAT]

```
#include <stdio.h>
    int main()
    {
        int x=5, y=5;
        while(x-=y++<10){
        printf("GATE WALLAH\n");
        }
    return 0;
    }
```

1,2,3,4

False

0, 1, 2, 3, 4

x: 5 4 3 2 1 0

y: 5 6 7 8 9 10

$x = x - (9 < 10)$

$x = x - 1$

$x = 0$

$x = x - (y++ < 10)$

$5 < 10$

$x = x - 1$

$x = x - (6 < 10)$

$x = x - 1$

$x = x - (7 < 10)$

$x = x - 1$

$x = 2$

$x = x - (8 < 10)$

$x = x - 1$

$x = 1$

The number of times "GATE WALLAH" printed is 4.

4 times


THANK YOU GW
SOLDIERS !