

CS & IT ENGINEERING

Programming in C



Recursion

DPP 04 Discussion



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TOPICS TO BE COVERED

01 Question

02 Discussion

Q.1

Consider the following function:

```
int func(int a)
{
    static int b=1;
    b=b+a;
    if((b%a)%2!=0) return a+func(b+a);
    return b-a;
}
```

The value returned by func(5) is _____.

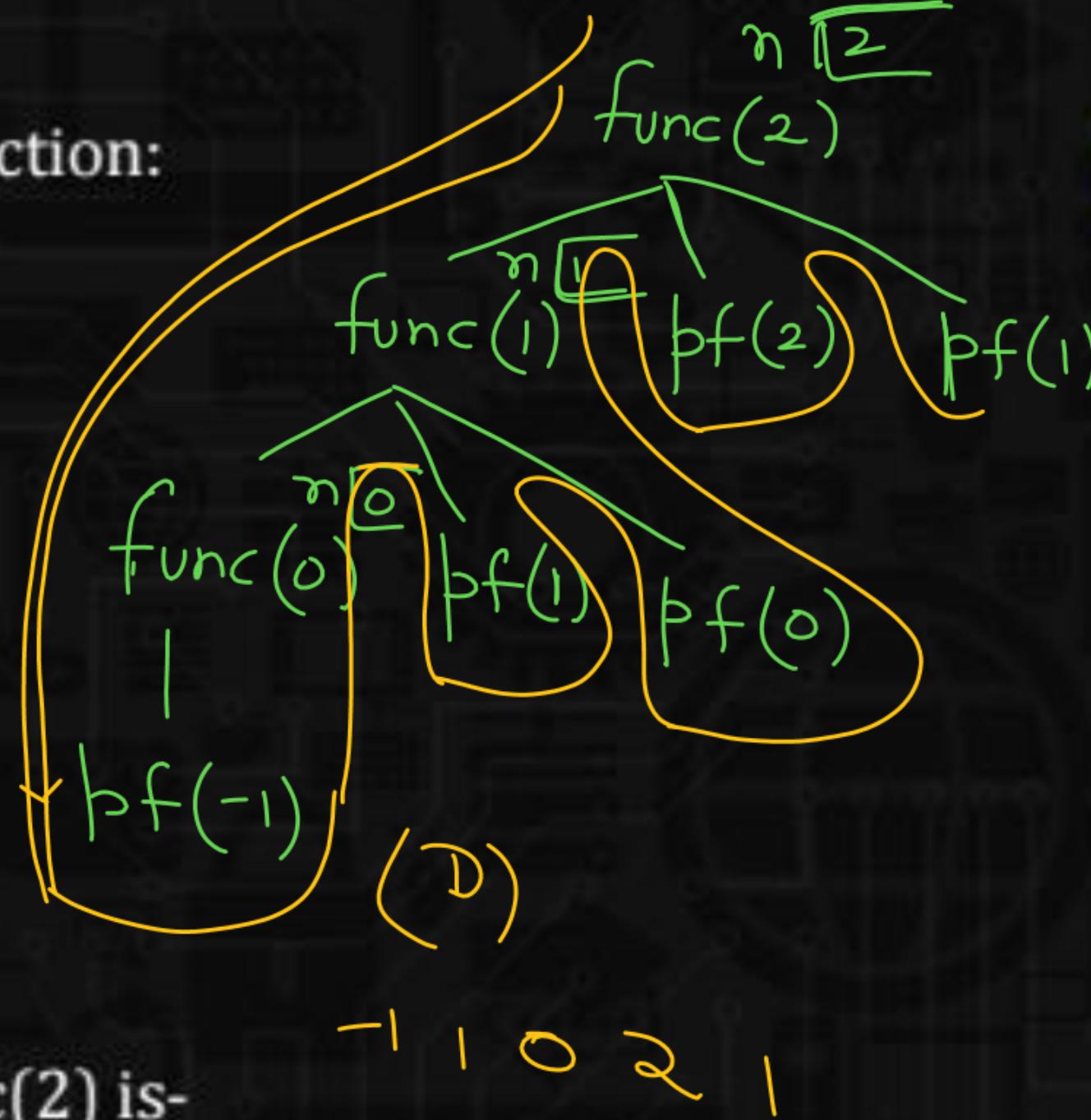
b
K617**[NAT]**P
W
$$\begin{array}{l} \text{func}(5) \\ | \\ 5 + \text{func}(11) \\ | \\ 6 \end{array}$$
$$\begin{array}{l} 6 \div 5 \\ 1 \div 2 \mid = 0 \\ 11 \mid = 0 \\ \text{True} \\ \hline 17 \div 11 \end{array}$$
$$\begin{array}{l} 6 \div 2 \mid = 0 \\ 0 \mid = 0 \end{array}$$

Q.2

Consider the following function:

```
void func(int n)
{
    if(n>0){
        ① [func(n-1);   X
            printf("%d\t", n);
        }
        ② printf("%d\t", n-1);
    }
}
```

The output printed by `func(2)` is-



A.

-1 1 0 2 1

C.

-1 1 0 2 -2 1

B.

-1 1 0 2 1 2

D.

-1 1 0 2 1

[MCQ]

Q.3

Consider the following function:

```
int func(int n)
```

```
{
```

```
    if(n>0){
```

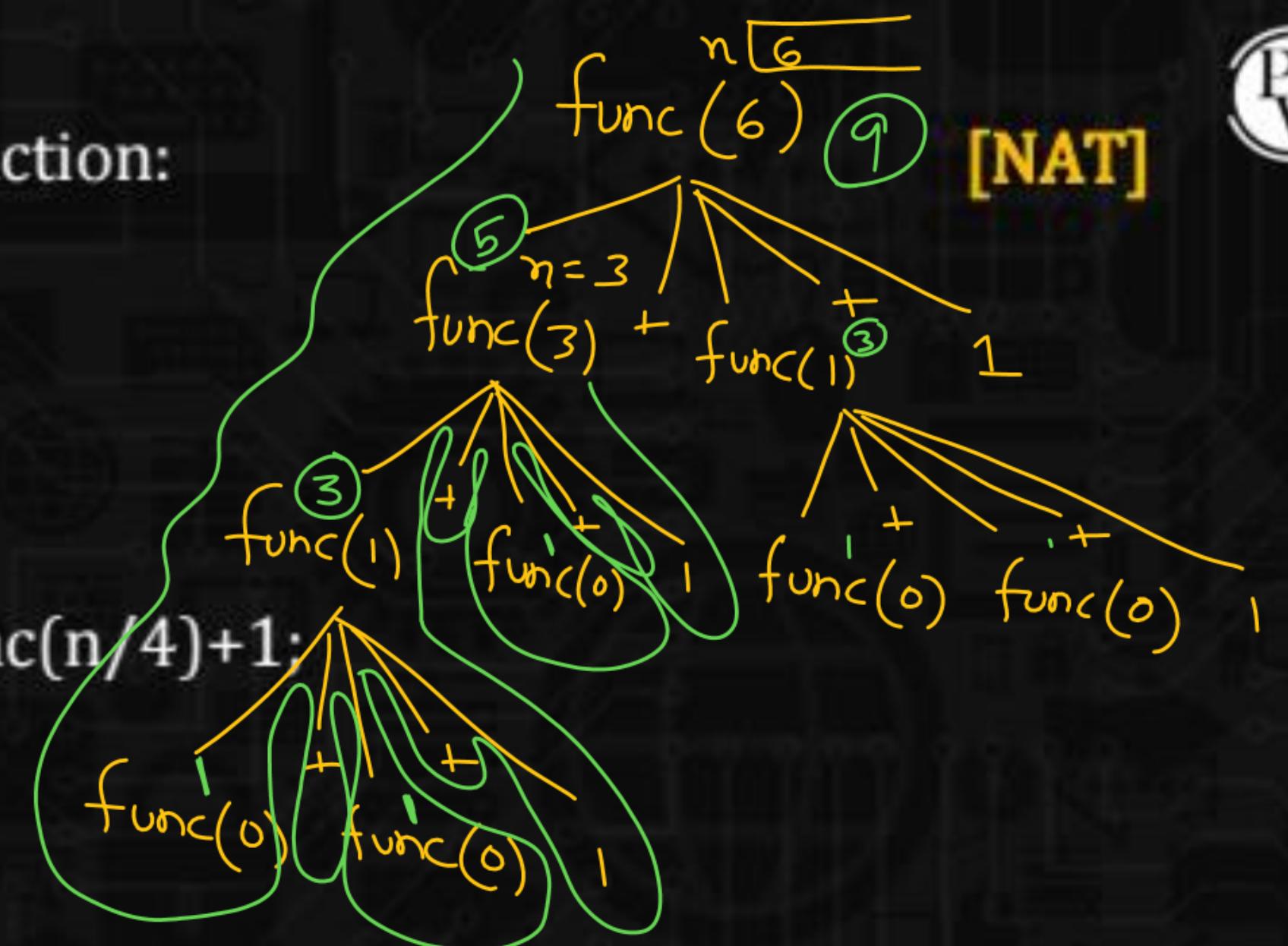
```
        return func(n/2)+func(n/4)+1;
```

```
}
```

```
    return n+1;
```

```
}
```

The value returned by $\text{func}(6)$ is 9

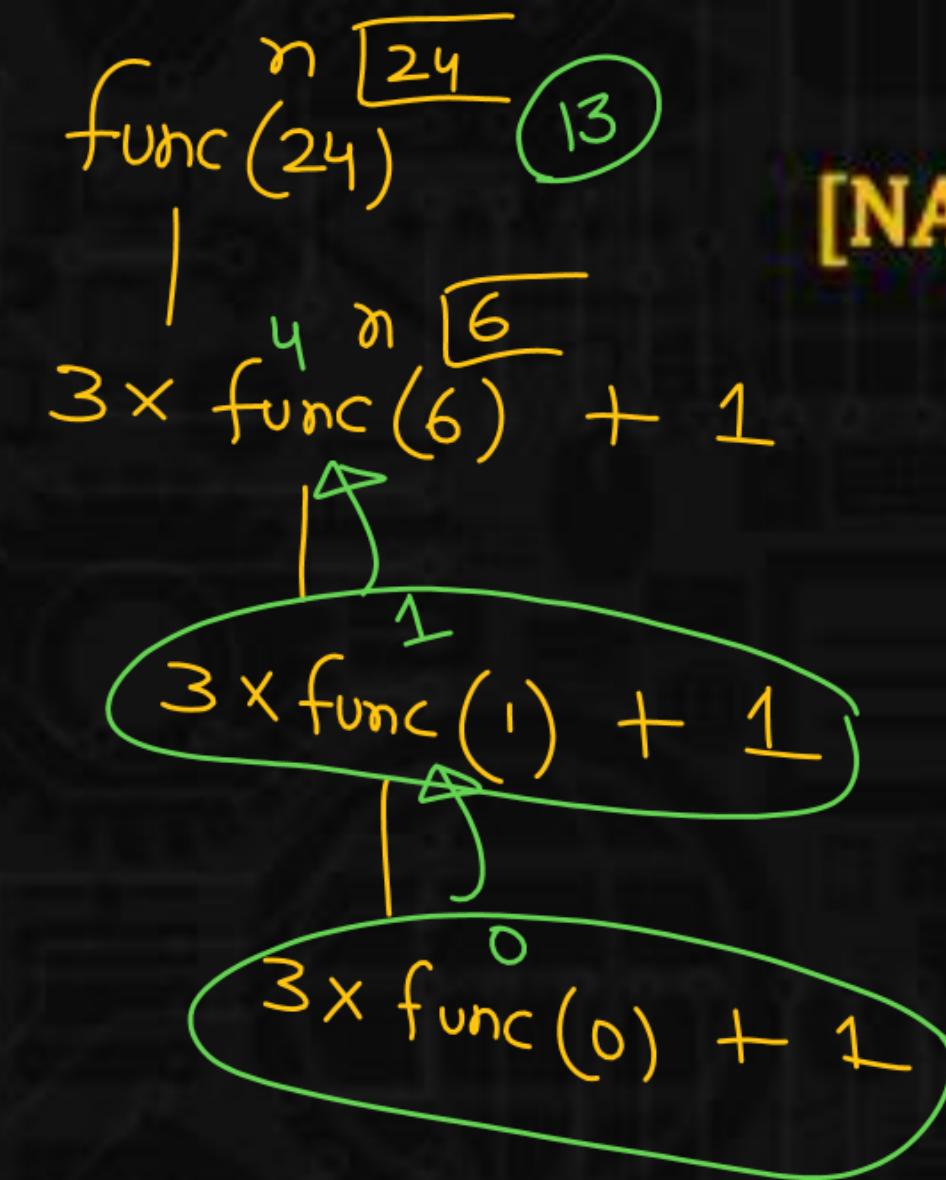


Q.4

Consider the following function:

```
int func(int n)
{
    if(n>0){
        return 3*func(n/4)+1;
    }
    return n;
}
```

The value returned by $\text{func}(24)$ is 13.



[NAT]

Q.5

Consider the following function:

```
int func(int n)
```

```
{
```

```
    static int k=0;
```

```
    if(n>0){
```

```
        k++;
```

```
        return 2*func(n/2)+k;
```

```
}
```

```
    return n+k--;
```

```
}
```

The value returned by $\text{func}(8)$ is _____.

$k \boxed{\frac{234}{\cancel{0+}}^3}$

$\cancel{\cancel{log}}$

$\text{func}(8)$

$\boxed{n \sqrt[3]{4}}$

$2 \times \text{func}(4) + k \Rightarrow \boxed{\cancel{\cancel{log}}}$

$\boxed{n \sqrt[3]{2}}$

$2 \times \text{func}(2) + k \Rightarrow \boxed{\cancel{\cancel{53}}}$

$\boxed{n \sqrt[3]{1}}$

$2 \times \text{func}(1) + k \Rightarrow 2 \times 11 + 3 = \boxed{25}$

$\boxed{n=0}$

$2 \times \text{func}(0) + k \Rightarrow 2 \times 4 + k = \boxed{11}$

$\boxed{(0+4)}$

Q.6

Consider the following function:

```
int func(int n, int i)
{
    if(n==0) return 0; B
    else if(n%2){
        return func(n/2, 2*i)+i; ⇒ odd
    }else return func(n/2, 2*i)-i;
}
```

Even

The value returned by $\text{func}(14, 1)$ is-

A.

1

B.

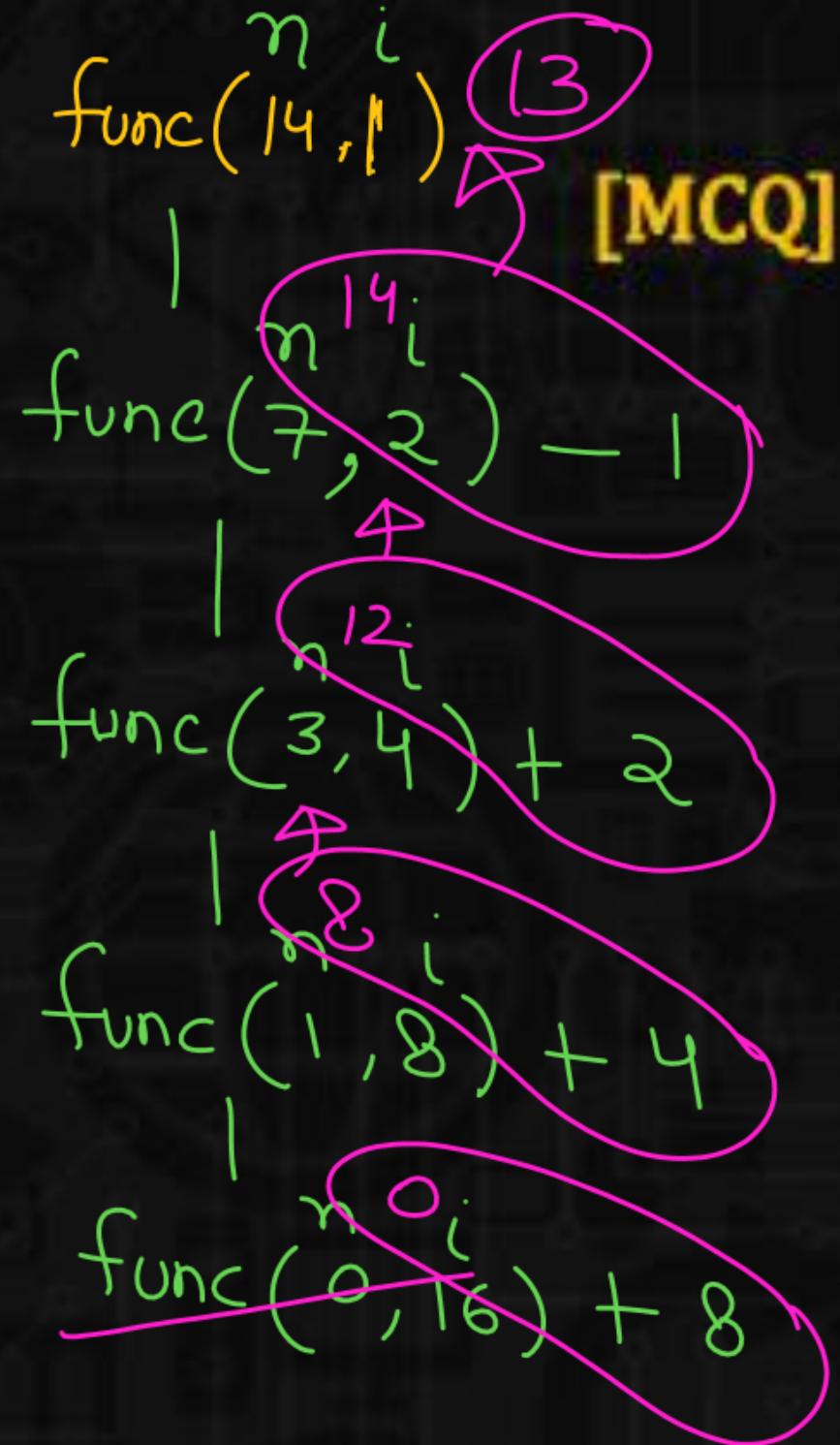
13

C.

15

D.

0



Q.7

Consider the following function:

```
int func(int n)
{
    static int i=0;
    if(n/2){
        i = i-1;
        return func(n/2)+i;
    }else return i;
}
```

The value returned by $\text{func}(7)$ is-

A.

-6

B.

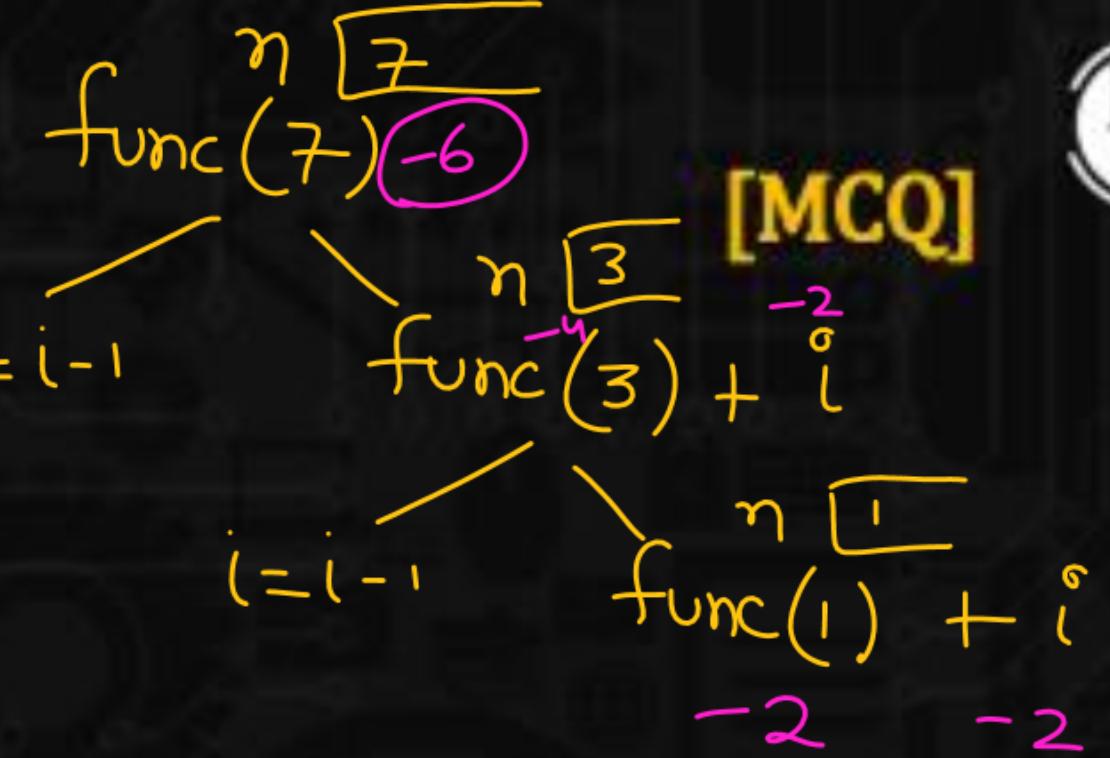
-12

C.

-18

D.

-21



Q.8

Consider the following function:

```
void display()
```

```
{  
    static int i;  
    if(i<=printf("GATE24")){  
        i=i+2;  
        display();  
    }  
}
```

```
int main()  
{
```

```
    int i=0;  
    for(i=0;i<3;i++)  
        display();  
    return 0;  
}
```

1,2,3,4,5,6,7 i 0 2 4 6 8

A.

6

B.

5

C.

7

D.

9

[MCQ]



The number of times printf() executed is-

