Q.1 Consider the following function:

b | K617

[NAT]

(P W)

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 ___11___.

$6\%5$

$1\%2!=0$

$1!=0$

True

$17\%11$

$6\%2!=0$

$0!=0$

$a=5$
func(5)
|
$5+ func(11)$ $a=11$
|
6

Q.2

Consider the following function:

[MCQ]

```
void func(int n)
{
    if(n>0){
        func(n-1);
        printf("%d\t", n);
    }
    printf("%d\t", n-1);
}
```
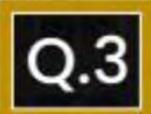
The output printed by func(2) is-

A. −1 1 0 2 1

B. −1 1 0 2 1 2

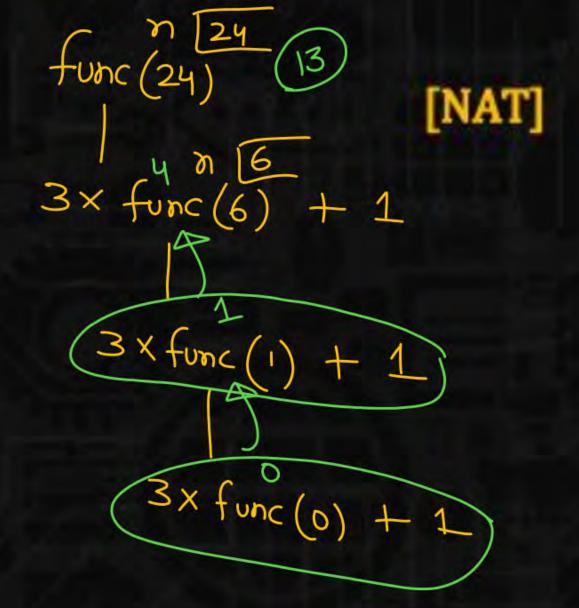C. −1 1 0 2 −2 1

D. −1 1 0 2 1

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 func(6) is __9__

Q.4

Consider the following function:

[NAT]

int func(int n)

{

   if(n>0){

      return 3*func(n/4)+1;

   }

   return n;

}

The value returned by func(24) is ___13___ .

$$\text{func}(24) \overset{n}{\overset{\lfloor 24 \rfloor}{}} \quad 13$$

$$3 \times \underset{\lfloor 6 \rfloor}{\overset{4}{\text{func}(6)}} \overset{n}{} + 1$$

$$3 \times \text{func}(1) + 1$$

$$3 \times \text{func}(0) + 1$$
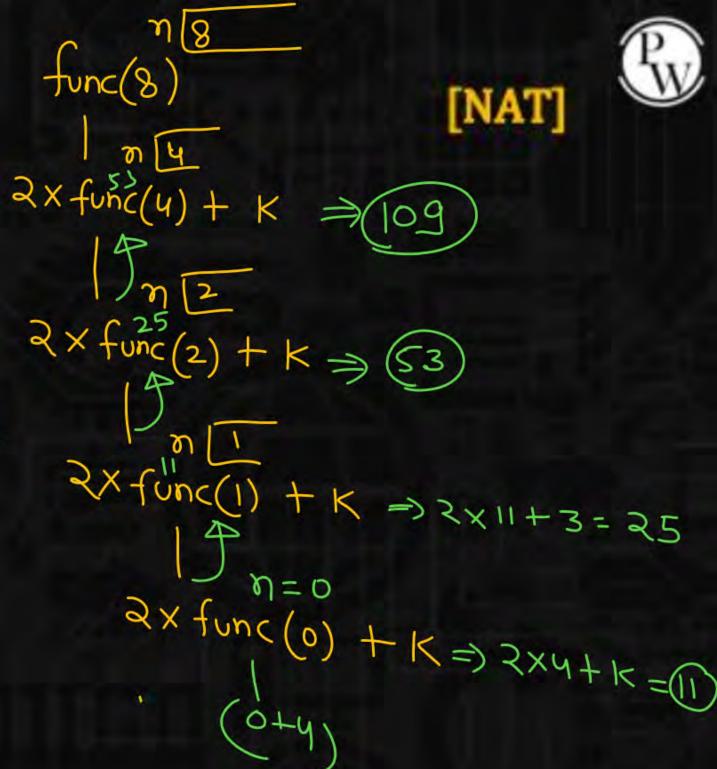
Q.5

Consider the following function:

[NAT]

int func(int n)

{

~~static int k=0;~~

if(n>0){

1. k++;

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

}

return n+k--;

}

$$n + k$$
$$k = k - 1;$$

The value returned by func(8) is _____.

$K \boxed{\begin{array}{c}234 \\ 01\end{array}}^3$

109

$$func(8) \overline{n \lvert 8}$$

$$\lvert \quad n \boxed{4}$$

$$2 \times func(4)^{53} + K \Rightarrow \boxed{109}$$

$$\uparrow$$

$$\lvert \quad n \boxed{2}$$

$$2 \times func(2)^{25} + K \Rightarrow \boxed{53}$$

$$\uparrow$$

$$\lvert \quad n \boxed{1}$$

$$2 \times func(1)^{11} + K \Rightarrow 2 \times 11 + 3 = 25$$

$$\uparrow$$

$$\lvert \quad n = 0$$

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

$$\lvert$$

$$(0 + 4)$$

Q.6

Consider the following function: [MCQ]

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

B
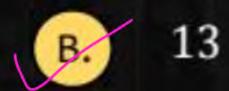
Even

The value returned by func(14, 1) is-

A. 1

B. 13

C. 15

D. 0

$func(14, 1)$ ⓷

$func(7, 2) - 1$

$func(3, 4) + 2$

$func(1, 8) + 4$

$func(0, 16) + 8$

Consider the following function:

int func(int n)

{

static int i=0;

if(n/2){

1. i--;

2. return func(n/2)+i;

}else return i;

}

The value returned by func(7) is-

A. −6

B. −12

C. −18

D. −21

[MCQ]

Handwritten annotations:

$\text{func}(7)\ (-6)$ — $n\ \boxed{7}$

$i\ \boxed{0 + -2}$ $i = i-1$ $\text{func}(3) + i$ — $n\ \boxed{3}$, -4, -2

$3/2 = 1$

$7/2 = 3 \to$ true

$i = i-1$ $\text{func}(1) + i$ — $n\ \boxed{1}$, -2, -2

(A)

Answer: A ✓

Q.8

Consider the following function:

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

i | 0 2 4 6 8

```
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;

}
```

0<=6 → True
2<=6 → True
4<=6 → True

6<=6

8<=6

i=0
① display

8<=6
i=1   8<=6
② display

③ i=2
display

The number of times printf() executed is-

[MCQ]

- A. 6
- B. 5
- C. 7
- D. 9

(C)