

QUESTION NO : 01

int a = 0, b = 0; $O(1)$

for (i = 0; i < N; i++)

{

 a = a + rand(); $O(N)$

}

for (j = 0; j < M; j++)

{

 b = b + rand(); $O(M)$

}

GENERAL NOTATION $O(N+M)$

QUESTION NO : 02

int a = 0; $O(1)$

for (i = 0; i < N; i++) $O(N)$

{

 for (j = N; j > i; j--)

 {

 a = a + i + j; $O(N*N)$

 }

}

GENERAL NOTATION $O(N^2)$

QUESTION NO : 03

int i, j, k = 0; $O(1)$

for (i = n / 2; i <= n; i++) $O(N/2)$

{

 for (j = 2; j <= n; j = j * 2) $O(\log(N))$

 {

 k = k + n / 2; $O(N/2 * \log(N))$

 }

}

GENERAL NOTATION $O(N \log(N))$

QUESTION NO : 04

int a = 0, i = N; $O(1)$

while (i > 0)

{

 a += i;

 i /= 2; $O(\log(N))$ VALUE IS DECREASED BY 2 FOR EACH LOOP

}

GENERAL NOTATION $O(\log(N))$

QUESTION NO : 05

for (var i=0;i<n;i++):

 i*=k $O(\log_k(N))$ VALUE IS INCREMENT WITH THE RESPECT TO K

GENERAL NOTATION $O(\log_k(N))$

QUESTION NO : 06

```
def fun(n):  
    if (n < 5):  
        print("GeeksforGeeks", end = "")  
    else:  
        for i in range(n):  
            print(i, end= " ")
```

GENERAL NOTATION **$O(1)$** **$O(N)$**

QUESTION NO : 07

```
def fun(a, b):  
    while (a != b):  
        if (a > b):  
            a = a - b  
        else:  
            b = b - a
```

$O(\text{abs}(a - b))$ Absolute difference between a and b

GENERAL NOTATION **$O(1)$** since the a and b are independent variables and we generalize to order of 1 and not on input size N.

QUESTION NO : 08

```
void fun(int n)  
{  
    for(int i=0;i<n;i++)  
        cout<<"GeeksforGeeks";  
}
```

GENERAL NOTATION **$O(\log(N))$** TWICE THE VALUE OF I IS COMPARED WITH N

QUESTION NO : 09

```
void fun(int n, int x)  
{  
    for (int i = 1; i < n; i = i * x) //or for(int i = n; i >=1; i = i / x)  
        cout << "GeeksforGeeks";  
}
```

GENERAL NOTATION **$O(\log_x(N))$** WITH THE BASE X

QUESTION NO : 10

```
void fun(int n)  
{  
    for (int i = 0; i < n / 2; i++)  
        for (int j = 1; j + n / 2 <= n; j++)  
            for (int k = 1; k <= n; k = k * 2)  
                cout << "GeeksforGeeks";  
}
```

GENERAL NOTATION **$O(N^2 \log(N))$** N SQUARE * LOG N WITH THE BASE 2

QUESTION NO : 11

```
void fun(int n)
```

```
{
```

```
    int i = 1;
```

```
    while (i < n)
```

```
    {
```

```
        int j = n;
```

```
        while (j > 0)
```

```
        {
```

```
            j = j / 2;
```

```
        }
```

```
        i = i * 2;
```

```
    }
```

```
}
```

$O(\log(N))$ WITH BASE 2 VALUE IS INCREASE BY 2 IN EACH LOOP

$O(\log(N))$ WITH BASE 2 VALUE IS DECREASED BY 2 IN EACH LOOP

GENERAL NOTATION

$O(\log(N))$ WITH BASE 2

ASSIGNMENT SUBMITTED BY: PARTHASARATHY. D

BATCH NO: DW19