Q 1. for (I =1; I<=n; I++)

```
for (J=1;J<=n;J++)
    printf ("Pankaj");
```

→ How many print() will execute ⇒

1 ⇒ for (i = 1; i <= n ; i++) ⟶ n

for (J = 1 ; J <= n ; J++) ⟶ n

printf("Pankaj");

$$\boxed{\text{Total} = n^2}$$

Q 2. for (I =1; I<=n; I+=2)

```
for (I =1; I<=n; I+=2)
        for(J=1;J<=n;J++)
                printf("Pankaj");
```

2 =>

```
for ( i=1; i<=n; i+=2)              -> ⌈n/2⌉
    for ( j=1; j<=n; j++)           -> n
        printf("Pankaj");
```

$$\boxed{Total = \lceil \frac{n}{2} \rceil \times n}$$

Q 3. for (I =1; I<=n; I=I*3)

printf("Pankaj");

3 $\Rightarrow$

```
for ( i=1;  i<=n; i=i*3 )
        printf("Pankaj ");
```

$\longrightarrow \lfloor \log_3 n \rfloor + 1$

$$\boxed{\text{Total} = \lfloor \log_3 n \rfloor + 1}$$

Q 4.
```
for (I =1; I<=n; I++)
    for ( J=1 ; J<=n; J=J*2)
        printf("Pankaj");
```

Q8 for(i=1; i<=n; i++) $\longrightarrow n$

for(j=1; j<=n; j=j*2) $\longrightarrow \lfloor \log_2 n \rfloor + 1$

printf("Pankaj");

$$\boxed{\text{Total} = n \times \left(\lfloor \log_2 n \rfloor + 1 \right)}$$

Q 5. for (I =1; I<=n; I=I*2)

```
for(J=1;J<=n;J=J*2)
    printf("Pankaj");
```

5 => for(i=1; i<=n; i=i*2) ⟶ $\lfloor \log_2 n \rfloor + 1$

for (j=1; j<=n; j=j*2) ⟶ $\lfloor \log_2 n \rfloor + 1$

printf("lankag");

$$\boxed{\text{Total} = \left(\lfloor \log_2 n \rfloor + 1 \right)^2}$$

Q 6. for (I =1; I<=n; I=I*2)

for(J=1;J<=n;J=J*3)

printf("Pankaj");

6 ⇒ for(i = 1; i <= n; i = i * 2) $\longrightarrow \lfloor \log_2 n \rfloor + 1$

for(j = 1 ; j <= n; j = j * 3) $\longrightarrow \lfloor \log_3 n \rfloor + 1$

printf("Pankaj")

$$\boxed{\Rightarrow \text{Total} = \left(\lfloor \log_2 n \rfloor + 1 \right) \left(\lfloor \log_3 n \rfloor + 1 \right)}$$

Q 7. for (I =1; I<=n ; I++)

```
for ( J=1 ; J<=n ; J=J*2)
    for ( K=1 ; K<=n ; K=K*2)
        printf("Pankaj");
```

7 ⇒ for (i = 1 ; i <= n ; i++) $\longrightarrow n$

for (J = 1 ; J <= n ; J = J*2) $\longrightarrow \lfloor \log_2 n \rfloor + 1$

for (K = 1 ; K <= n ; K = K*2) $\longrightarrow \lfloor \log_2 n \rfloor + 1$

printf("Pankaj");

$$\boxed{\text{Total} = n \times \left(\lfloor \log_2 n \rfloor + 1 \right)^2}$$

Q 8.

```
for (I= n/2 ; I <=n ; I++)
    for (J=1 ; J<=n/2 ; J++)
        for(K=1 ; K<=n ; K=K*2)
            printf("pankaj"); //assume n is even
```

8 →

```
for ( i = n/2 ; i <= n ; i++ )
  for ( j = 1 ; j <= n/2 ; j++ )
    for ( k = 1 ; k <= n ; k = k*2 )
      printf ("Pankaj");
```

$\longrightarrow n - \frac{n}{2} + 1 = \frac{n}{2} + 1$

$\longrightarrow n/2 - 1 + 1 = \frac{n}{2}$

$\longrightarrow \lfloor \log_2 n \rfloor + 1$

$$\boxed{\text{Total} = \left(\frac{n}{2} + 1\right) \times \left(\frac{n}{2}\right) \times \left(\lfloor \log_2 n \rfloor + 1\right)}$$

Teacher's Signature ....

Q 9. for (I=1 ; I<=n ;I =I*2)

for (J=1 ; J<= I ; J++)

printf("pankaj");

9 ⇒ for (i=1 ; i<=n ; i=i×2)
for (j=1 ; j<=i ; ~~j++~~ j++)
printf ("Pankaj ");

$i=1, j=1$
No. = 1

$i=2, j=1,2$
No. = 2

$i=4, j=1,2,3,4$
No. = 4

$$\text{No. of times} = 1 + 2 + 2^2 + \cdots\cdots 2^K$$
$$= 2^{K+1} - 1$$
$$\boxed{= 2^{\lfloor \log_2 n \rfloor + 1} - 1}$$

$2^K <= n$

Q 10. for (I=1 ; I<=n ;I =I*2)

```
for ( J=1 ; J<= I ; J=J*2)
    printf("pankaj");
```

10 →

```
for (i=1; i<=n; i=i*2)
    for (j=1; j<=i; j=j*2)
        printf("Pankaj");
```

$\rightarrow \lfloor \log_2 n \rfloor + 1$

$\rightarrow \dfrac{\lfloor \log_2 n \rfloor + 2}{2}$

Now $= 1 + 2 + 3 + \cdots (k+1)$

$= \dfrac{(k+1)(k+2)}{2}$

$$\boxed{= \dfrac{(\lfloor \log_2 n \rfloor + 1)(\lfloor \log_2 n \rfloor + 2)}{2}}$$