Q 11.
```
for ( I=1 ; I<=n ;I ++)
    for ( J=1 ; J<= I ; J++)
        printf("pankaj");
```

Q.2

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

$$\sum_{i=1}^{n} \sum_{j=1}^{i} (1) = \sum_{i=1}^{n} i$$

$$= \frac{n(n-1)}{2} \quad \text{Ans}$$

```
Q 12. for ( I=1 ; I<=n ;I =I*2)
        for ( J=1 ; J<= I; J++)
                for( K=1 ; K<=10 ; K++)
                        printf("pankaj");
```

```
for (i=1; i<=n; i=i*2){
    for (j=1; j<=i; j++){
        printf("pankaj");
        for (k=1; k<=i0; k++)
            printf("pankaj");
```
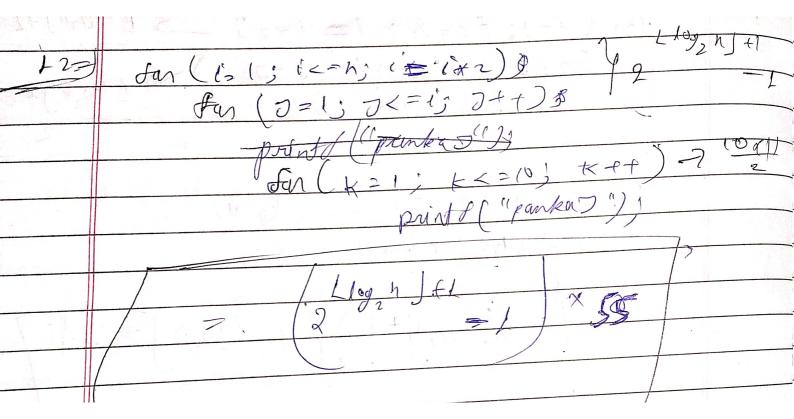
$$\sum 2^{\lfloor \log_2 n \rfloor + 1} - 1$$

$$\to \frac{i \cdot (i+1)}{2}$$

$$= \left(\frac{2^{\lfloor \log_2 n \rfloor + 1} - 1}{2} \right) \times$$
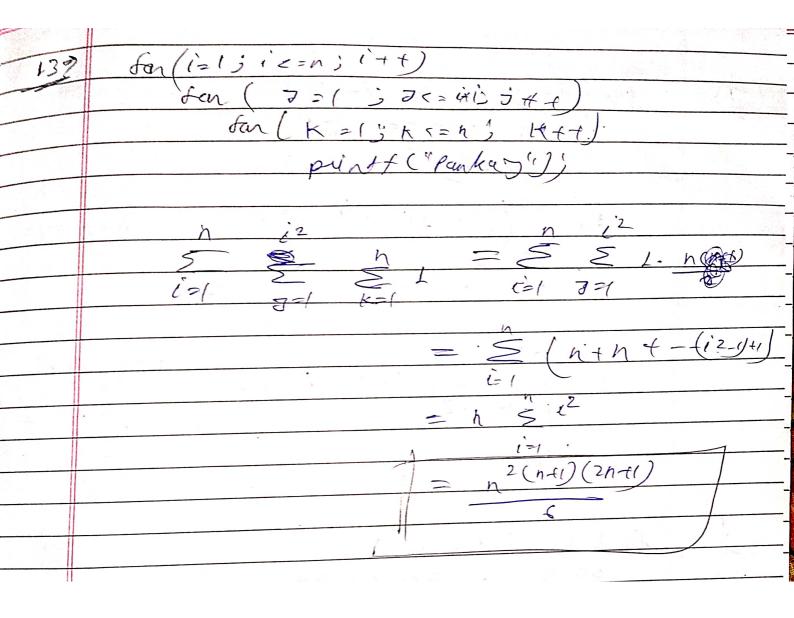
Q 13.
```
for ( I=1 ; I<=n ;I ++)
    for ( J=1 ; J<= I * I ; J++)
        for( K=1 ; K<=n ; K++)
            printf("pankaj");
```

13)
```
for (i=1; i<=n; i++)
    for ( j=1 ; j<=i+1; j++)
        for ( k=1; k<=n ;  k++)
            printf ("pankaj");
```

$$\sum_{i=1}^{n} \sum_{j=1}^{i^2} \sum_{k=1}^{n} 1 = \sum_{i=1}^{n} \sum_{j=1}^{i^2} 1 \cdot n$$

$$= \sum_{i=1}^{n} \left(n + n + \cdots - (i^2 - 1 + 1) \right)$$

$$= n \sum_{i=1}^{n} i^2$$

$$= n^2 \frac{(n+1)(2n+1)}{6}$$

```
Q 14. for ( I=1 ; I<=n ;I++ )
        for ( J=I ; J<= 3*I ; J++)
                printf("pankaj");
```

19a)

```
for (i=1; i<=n; i++)
    for (j=1; j<=3*i; j++)
        printf("pankaj");
```

$$\sum_{i=1}^{3i} \sum_{i=1} \quad = \quad \sum_{i=1}^{n} (2i+1) \quad = \quad 2\,\frac{n(n+1)}{2} + n$$

$$= \boxed{n^2 + 2n}$$

```
Q 15. for ( I=1 ; I<=n ;I=I*3 )
        for ( J=I ; J<= n ; J++)
                printf("pankaj");
```

15=]

```
for ( i=1; i<=n; i=i*3)
    for ( j=1; j<=n; j++)
        printf("pankaj");
```

$$N_o. = \left((n-1)+1\right) + \left((n-3)+1\right) + \cdots \left(n-3^K+1\right)$$

$$= (n+1)(K+1) - \frac{3^{3K+1}-1}{3^n-1}$$

$$= \boxed{\left(\lfloor \log_3 n \rfloor + 1\right)(n+1) + \frac{3^{\lfloor \log_2 n \rfloor +1}}{2}}$$

```
Q 16. for ( I=0 ; I<=n-1 ; I ++)
         for ( J=2 ; J<= I + 1 ; J++)
              for( K=J + 1 ; K<=I + J ; K++)
                   printf("pankaj");
```

16)
```
for ( i=1; i<=n; i++ )
    for ( j=2; j<=i; j++ )
        for ( k =j+1; k<=i; k+1 )
            printf ("Parkaj")
```

$$\sum_{i=1}^{n} \sum_{j=2}^{i-1} \sum_{j=1}^{i-j} 1 = \sum \sum \sum i$$

$$= \sum \left((i+1) - 2 + 1 \right) \times i$$

$$= \sum i^2$$

$$= \frac{n(n+1)(2n+1)}{6} \quad —①$$

```
Q 17. for ( I=1 ; I<=n ;I ++)
        for ( J=1 ; J<= I ; J++)
                for( K=J ; K<=I + J ; K++)
                        printf("pankaj");
```

17⇒ for (i=1; i<=n; i++)
    for (j =1; j<=i; j++)
      for (k=1; k<=i+j; k++)
        printf ("Pankaj");

$$\sum_{i=1}^{n} \sum_{1}^{i} \sum_{1}^{i+j} 1 = \sum \sum (i+j-j+1)$$

$$= \sum \sum (i+1)$$

$$= \sum (i-1+1)(i+1)$$

$$= \sum i^2 + i$$

$$= \frac{n(n+1)}{2} = \frac{(2n+1)}{3} \quad \text{Ans}$$

Q 18.
```
for (I=1 ; I<=n ; I++)
    for (J=I ; J<=2*I ; J++)
        printf("pankaj");
```

```
for (i=1; i<=n; i++)
    for (j=1; j<=2i; j++)
        prindf("Pank q j");
```

$$\sum_{i=1}^{n} \sum_{1}^{2i} 1 = \sum_{1}^{n} (i+1) \Leftarrow$$

$$= \frac{n(n-3)}{2}$$

Q 19.
```
for (I=1 ; I<=n ; I++)
    for (J=I+1 ; J<=n ; J++)
        for (K=1 ; K<=J ; K++)
            printf("pankaj");
```

19-9)

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

$$\sum \sum \sum_{k=1}^{j} (1) = \sum \sum_{j=i+1}^{n-i} j$$

$$= (i+1) + (i+2) + \sim \sim n$$

$$= \frac{n(n+1)}{2} - \frac{i(i+1)}{2}$$

$$= \sum_{i=1}^{n} \frac{n(n+1)}{2} - \sum_{i=1}^{n} \frac{i(i+1)}{2}$$

$$= \frac{n^2(n+1)}{2} - \frac{1}{2} \times \frac{n(n+1)(n+1)}{6} - \frac{n}{2}$$

$$\boxed{= \frac{n(n+1)(n-1)}{3}}$$

Q 20. What is the total number of multiplication : D=2;

```
for ( I=1 ; I<=n ; I++)
    for (J=I ; J<=n ; J++)
    for (K=J+1 ; K<=n ; K++)
        D=D * 3;
```

20=9

```
for ( i = 1; i <= n; i++)
    for ( j = 1; j <= n; j++)
        for ( k = j+1; k <= n; k++)
            x = p*3
```

$$\sum_{i=1}^{i=n} \sum_{j=1}^{n} \sum_{k=j+1}^{n} (1) = \sum \sum (n \neq)$$

$$= (n-i) + (n-(i+1)) \quad \underline{\quad} n-y$$

$$\equiv 1 + 2 + \cdots (n-i)$$

$$= \frac{(n-i)(n-i+1)}{2}$$

$$\sum_{i=1}^{n} \frac{1}{2} (n^2 + i^2 - 2in + n - i)$$

$$= \frac{1}{2} \left[\sum n^2 + \sum i^2 - \sum 2in + \sum n - \sum i \right]$$

$$= \frac{1}{2} \left(\frac{n^2 \, n(n+1)(2n+1)}{6} - \frac{\cancel{2} n^2 (n+1)}{\cancel{2}} + n^2 - \frac{n(n+1)}{2} \right)$$

$$= \frac{1}{2} \left(\frac{n(n+1)(2n+1)}{6} - \frac{n(n+1)}{2} \right)$$

$$= \frac{n(n+1)}{12} \left(2n+1 - 3 \right)$$

$$\boxed{= \frac{n(n+1)(2n-1)}{6}}$$