Pattern

① No. of outer loop runs (No. of rows)
② No. of inner loop runs (No. of columns)
③ what to print
④ inner loop - \n - outerloop

Q① 3 by 3.c

```
x x x
x x x
x x x
```

```
for (i=1 ; i<=3 ; i++)
{
    for (J=1; J<=3; J++)
    { print ("*"); }
    print ("\n");
}
```

step 1) i=1 condn true loop me enter
J=1 " "
J=2 " "
J=3 " "
J=4 condn false
loop se bar
print ("\n");

x x x

i=2 condn true
J=1, 2, 3

x x x

Q2?

```
1 1 1 1 1
2 2 2 2 2
3 3 3 3 3
4 4 4 4 4
5 5 5 5 5
```

Note: for row value is const
outer loop me change krna
to i ki value print krdo

Q3)
```
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
```
column constant
row change hui
to j ki value print krado

Q4)
```
5 5 5 5 5
4 4 4 4 4
3 3 3 3 3
2 2 2 2 2
1 1 1 1 1
```
outer loop variable dependent
5-1

Q5)
```
5 4 3 2 1
5 4 3 2 1
.
.
```
inner loop 5-1 variable par depend

Q6
```
A A A A A
B B B B B
C C C C C
D D D D D
E E E E E
```
outer loop → 5 A-E
inner loop → 5 such

Q7)
```
A B C D E
A B C D E
```
inner loop A-E

Q8)
```
E E E E E
D D D D D
```

Q9)
```
E D C B E
```

Q10)
```
X
X X
X X X
X X X X
X X X X X
```
outer row (5) 1-5
inner column
1 row 1 bar
2 row 2 bar
i=1 j=1
i=2 j=1,2
i=3 j=1,2,3

Q11

```
A
B B B
C C C
```

```
A
A B
A B C
```

```
1
2 2
3 3 3
```

Q12

```
x x x x x
x x x x
x x x
x x
x
```

out NO. of rows ⑤ i = 1:5

inner NO. of columns 5, 4, 3, 2, 1

J = 1, 2, 3, 4, 5

J = 1, 2, 3, 4

i = 5 x i = 1

i = 4 i = 2

i = 3 i = 3

i = 2

i = 1

J = 1, 2, 3, 4, 5

J = 2, 3, 4, 5

J = 3, 4, 5

i = 5 i ≤ 1

J ≤ i

i = 1 , i ≥ 5

J ≥ i

```
1 1 1 1 1
2 2 2 2
3 3 3
```

```
5 4 3 2 1
5 4 3 2
5 4 3
```

```
5 5 5 5 5
4 4 4 4
3 3 3
```

```
1 2 3 4 5
1 2 3 4
```

i = 4 J = 5 - 1

i = 2 i = 2 J = 5 - 2

i = 1 J = 5 - 1

i = 5 J = 1 - 5

i = 4 J = 1 - 4

out rows

i = 5 J = 1 - 5

i = 4 J = 1 - 4

J ≥ i

J >= i

J <= i

J ≥ i

Q13) A A A A A

B B B B

C C C

i = A(1) J = 5 - 1 ∈ A

i = (B)/2) 5 - 2 ∈ B

J <= i

i = 0 4 - 0

1 4 - 1

2

3

4

```
A B C D E        E E E E E        E D C B A
A B C D          D D D D          E D C B
A B C
A B
A
```

Q14)

Kyunki ple space h

Jo ple vo loop ple.

No. of outer loop (rows) → (5)

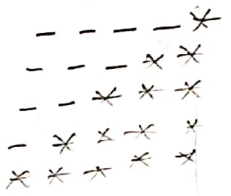
No. of 1st inner loop (space)

No. of 2nd inner loop (column)

```
n=5
for (i=1; i<=n; i++)
{
  for (k=n-1; k>=i; k--)
  { printf (" "); }
  for (j=1; j<=i; j++)
  { printf ("*"); }
  printf ("\n");
}
```

row 1 → space 4, * 1

row 2 → space 3, * 2



i=1

k = 4, 3, 2, 1

j=1

i=2

k = 4, 3, 2

j = 1, 2

i=3

k = 4, 3

j = 1, 2, 3

i=4

k = 4

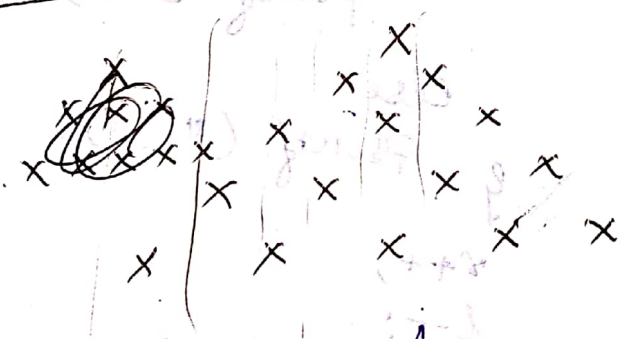
j = 1, 2, 3, 4

i=5

k → condn false.

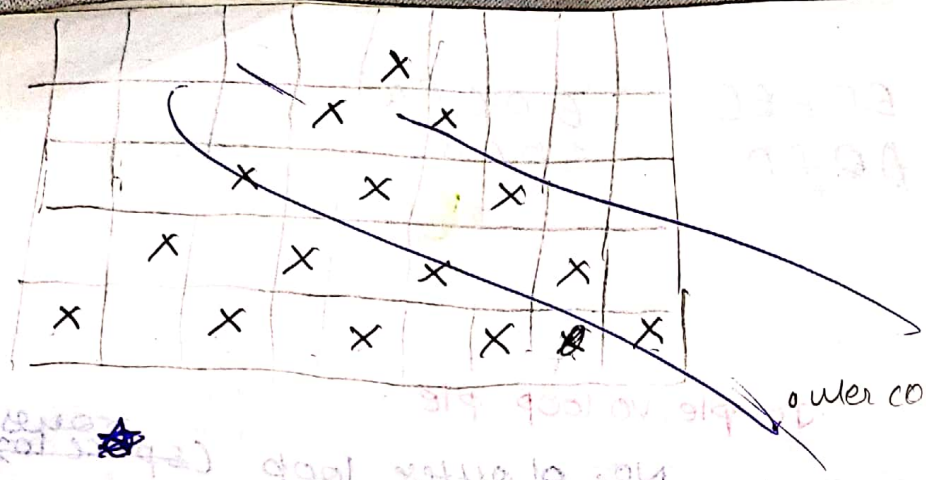
j → * * * **

Q15)

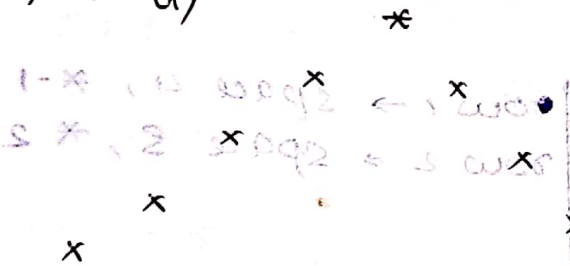


same as que 15

just printf (" * _ ");



Q167 a)



No. of outer loops (rows) → 5
inner loops (col) → 9

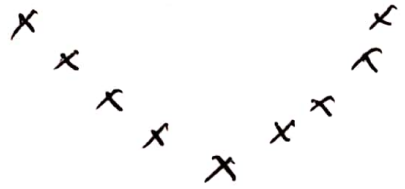
n=5

```
for (i=1; i<=n; i++)
{
    for (j=1; j<n*2; j++)
    {
        if (r==j || j==l)
            printf ("*");
        else
            printf ("_");
    }
    r++;
    l--;
    printf ("\n");
}
```

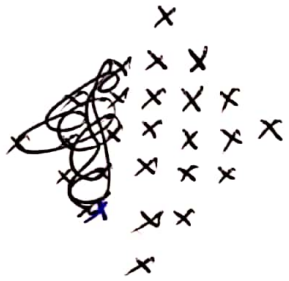
l=5 r=5
i=1
J=5
_ _ _ _ * _ _ _ _

l=4 r=6
i=2 J=4, J=6
_ _ _ * _ * _ _ _

b)



Q 17)



because $(3-(-3))$

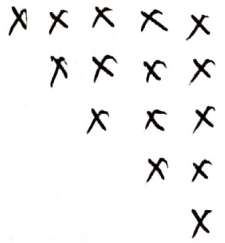
No. of outer loops → 7

```
i= -3; i<=3; i++
J=3; J>=abs(i); J--
```

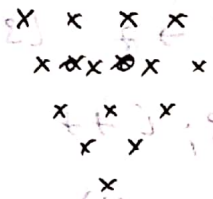
Q 18

outer loops ⑦ {-3, 3}

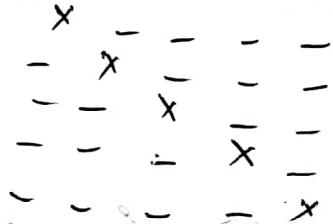
Q18



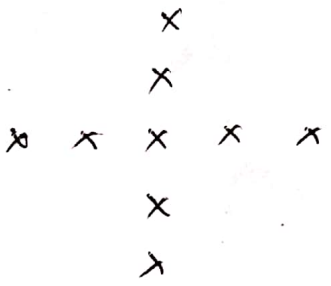
Q19



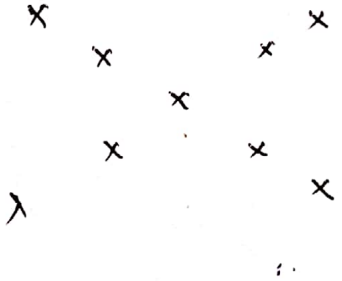
Q20)



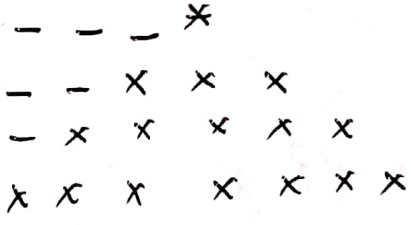
Q21)



Q22)



Q 25)



```
i=1 ; i<=4 ; i++
S=3 ; S>=i ; S++
J=1 ; J<2i-1 ; J++
```