y-axis

P_4 (10,90) P_3 (90,90)

P_1 (10,10) P_2 (90,10)

100   90   10   (0,0)

x-axis

z-axis

1

10   90   100

y-axis

z-axis

P_4 P_3

P_1 P_2

x-axis

10

Billet size $(100 \times 100 \times 100)$ m

Cutter diameter = 6mm

→ <u>CNC Milling :</u>

N1   G21   G94

N2   G28   X0   Y0   Z0

N3   G90

N4   M06   T01

N5   M03   S1200

N6   G00   X10   Y10   Z5

N7   G01   Z-1   F3

N8   G01   X90   Y10
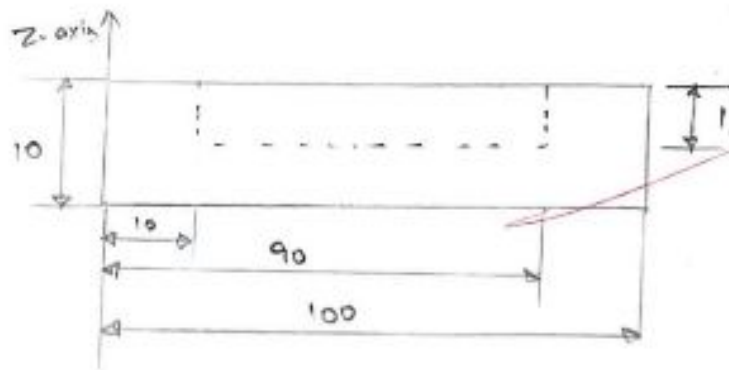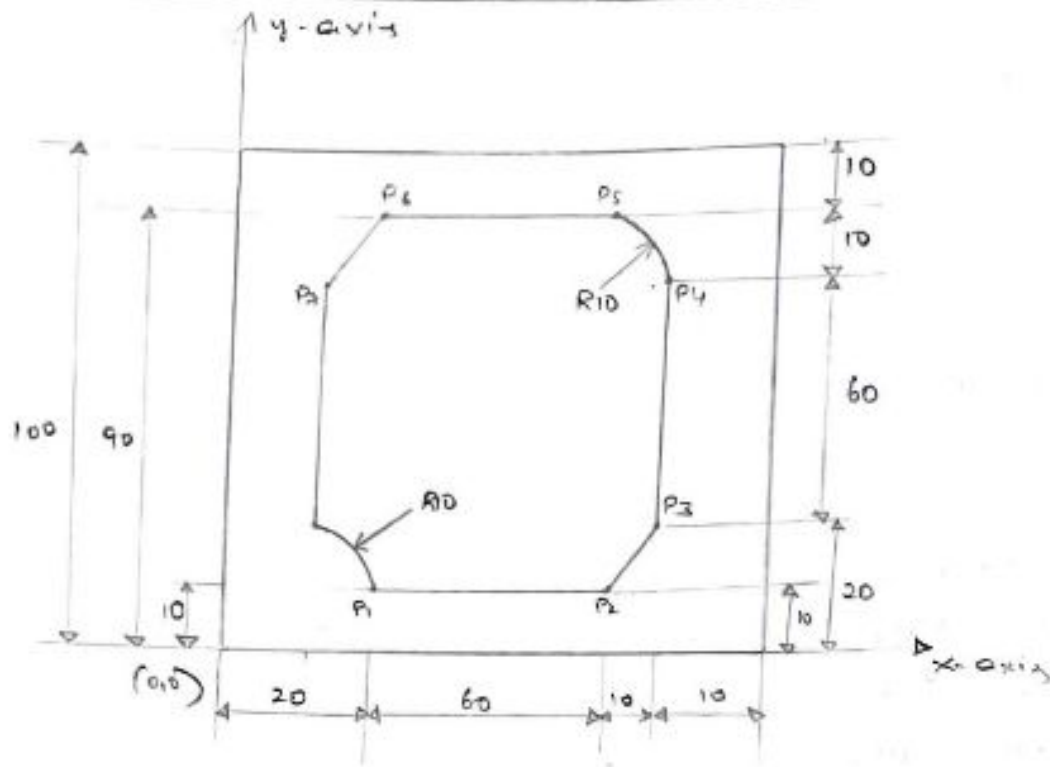
N9   G01   X90   Y90

N10   G01   X10   Y90

N11   G01   X10   Y10

N12   G00   Z5

N13   G28   X0   Y0   Z0

N14   M05

N15   M30

y-axis

10

P6   P5

10

P7   R10   P4

60

100   90

A0

P3

20

10

P1   P2

10

(0,0)

20   60   10   10

x-axis

Z-axis

10

10

90

100

②

N1	G21	G94		
N2	G28	X0	Y0	Z0
N3	G90			
N4	M06	T01		
N5	M03	S1200		
N6	G00	X20	Y10	Z5
N7	G01	Z-1	F3	
N8	G01	X80	Y10	
N9	G01	X90	Y20	
N10	G01	X90	Y80	
N11	G03	X80	Y90	R10
N12	G01	X20	Y90	
N13	G01	X10	Y80	
N14	G01	X10	Y20	
N15	G02	X20	Y10	R10
N16	G00	Z5		
N17	G28	X0	Y0	Z0
N18	M05			
N19	M30			

40

y-axis (+)   40

(-60,60)

R100   (60,60)

40   40

50   50   50

20   50   50

(0,0)

200   x-axis (-)   x-axis (+)

(-100,100)

y-axis (-)

10   1'

200
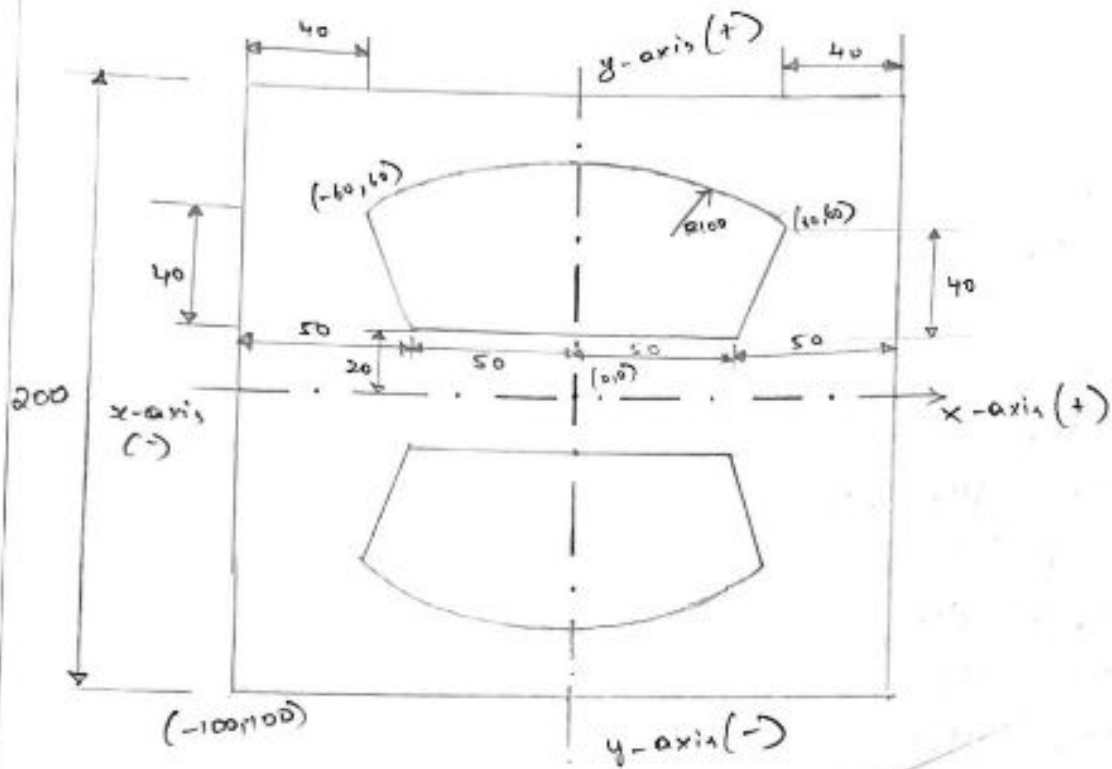
1) write a part program to perform mirrory operation on the componed along x-axis.

```
N1    G21  G94
N2    G28  X0 Y0 Z0
N3    G90
N4    M06 T01
N5    M03 S1200
N6    G00  X0 Y0 Z5
N7    M98  P001  3333
N8    M70
N9    M98  P001  3333
N10   M80
N11   G28  X0 Y0 Z0
N12   M05  M30
N13   O    3333
N14   G00  X0 Y20 Z5
N15   G01  Z-1  F5
N16   G01  X50 Y20
N17   G01  X60 Y60
N18   G03  X-60 Y60 R100
N19   G01  X-50 Y20
N20   G01  X0 Y20
N21   G00  Z5
N22        X0 Y0
N23   M99
```
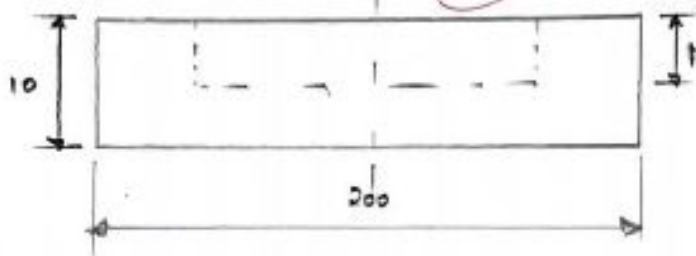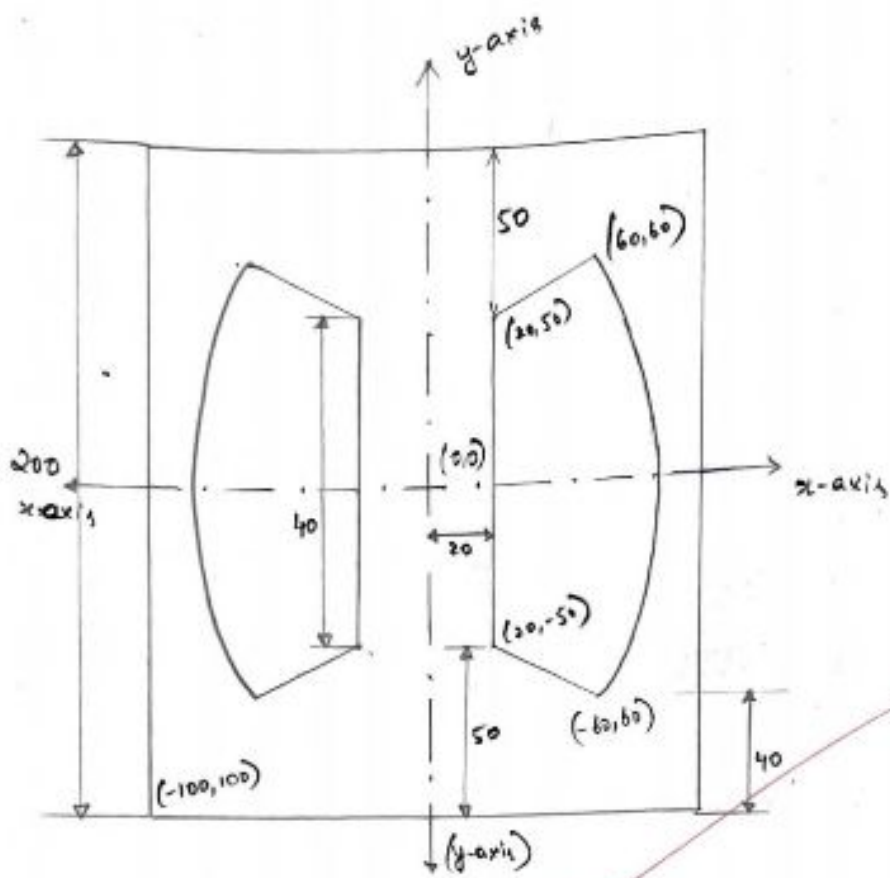
y-axis

50

(60,60)

(20,50)

200
x-axis

(0,0)

x-axis

40

20

(20,-50)

(-60,60)

50

40

(-100,100)

(y-axis)

10

t

200

2) write a part program to perform mirroring operation on the component along x-axis. cutter dia = 6mm

G21 G94

G28 X0 Y0 Z0

G90

M06 T01

M03 S1200

G00 X0 Y0 Z5

M98 P001 3333

M71

M98 P001 3333

M81

G28 X0 Y0 Z0

M05 M30

O 3333

G00 X20 Y0 Z5

G01 Z-1 F5

G01 X20 Y50

G01 X60 Y60
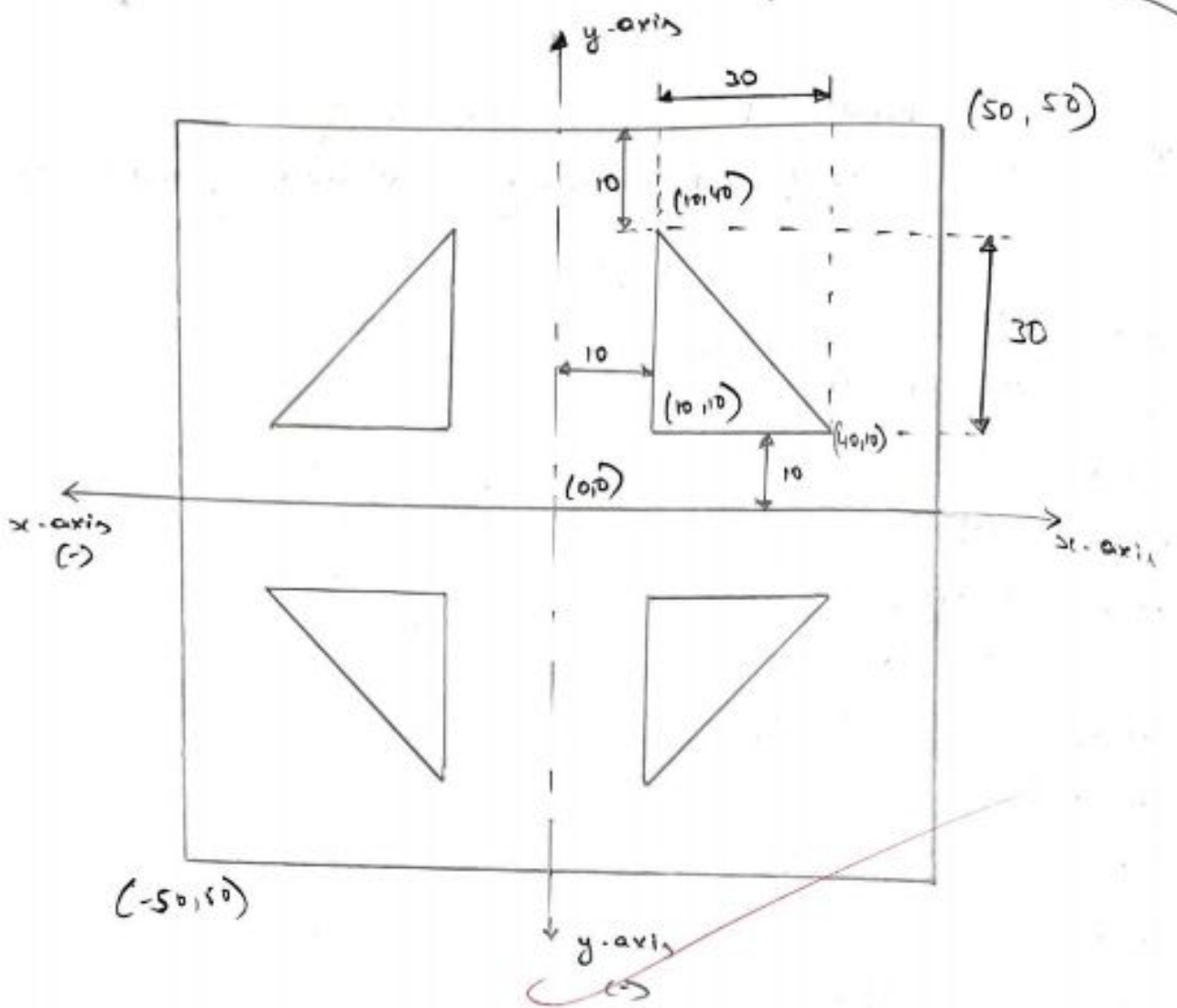
G02 X60 Y-60 R100

G01 X20 Y-50

G01 X20 Y0

G00 Z5

X0 Y0

M99

3) write a part program to perform mirroring operation on the compound as shown (both x-axis and y-axis)

G21 G94
G28 X0 Y0 Z0
G90
M06 T0101
M03 S1200
G00 X0 Y0 Z1
M98 P001 4444
M70
M98 P001 4444
M80
M71
M98 P001 4444
M81
M70
M71
M98 P001 4444
M80
M81
G28 X0 Y0 Z1
M05
M30
0 4444
G00 X10 Y10 Z5
G01 Z-1 F5
X10 Y40

X40   Y10

X10   Y10

G00   Z5

X0   40

M99

→ Drilling operation (G73 cycle)

Syntax — G73 X__ Y__ Z__ P__ Q__ R__ F__ K__

→ Hole depth

→ Position of hole

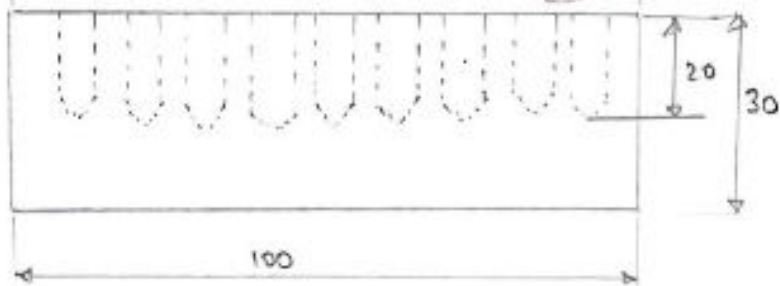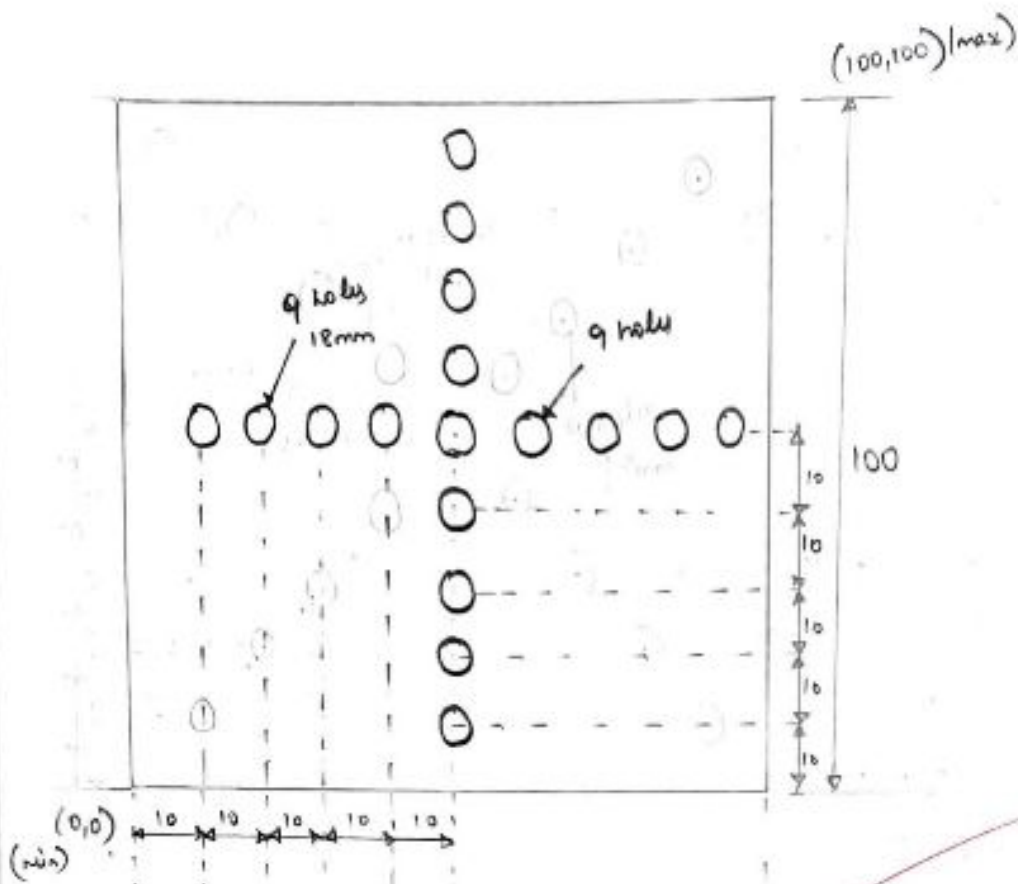→ Drill code

P - Dwell time (milli seconds)

Q - Peck increment (min)

R - Reference point

F - Feed (mm/min)

K - no. of holes

(100,100)(max)

9 holes
18mm

9 holes

100

10
10
10
10
10

(0,0)
(min)

10 10 10 10 10

20

30

100

write a part program to perform drilling operation on the component as shown.

N1   G21   G94

N2   G28   X0 Y0 Z0

N3   M06 T0101

N4   M03 S800

N5   G91 X10 Y50 Z-20   P500   Q1 R1 K1 F5

N6   X10 Y0 R8

N7   G80

N8   G28 X0 Y0 Z0

N9   G91 X50 Y10 Z-20   P500   Q1 R1 K1 F5

N10   X0 Y10 R8

N11   G80

N12   G28 X0 Y0 Z0

N13   M05

N14   M30