Sheet (3)
CNC M/C Tools
Part program – Milling Machine

Construct the part program for machining the part shown in figs below. The CNC milling machine has the following format:-

N3 G2 X3.2 Y3.2 Z3.2 I3.2 J3.2 K3.2 F4 S4 T2 M2

given that the machine is equipped with the following tools:-

- C. carbide insert shell end mill 50 mm diam., five teeth, located in turret No.1.
- HSS slot drill 6 mm dia.., located in turret No. 2.
- HSS end mill 12 mm diam located in turret No. 3.
- HSS end mill 3 mm diam located in turret No. 6.
- Drill 5 mm diam located in turret No. 9
- Drill 8 mm diam located in turret No. 4
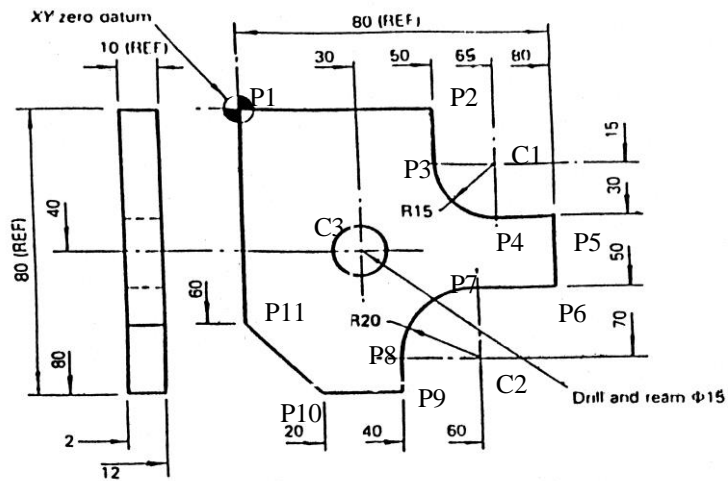- Drill 12 mm diam located in turret No. 5

Assume that the top surface of the row material is at 200 mm below Z zero, and the machine support the tool length and diameter compensation
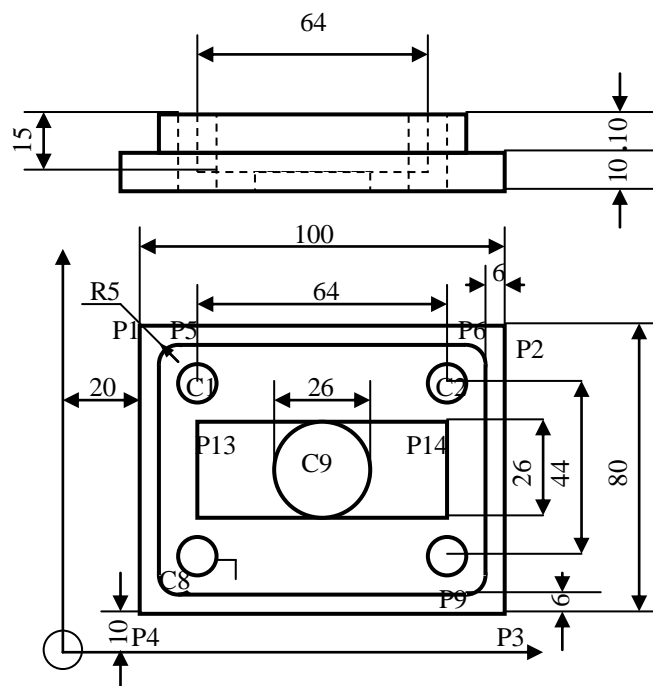
A)
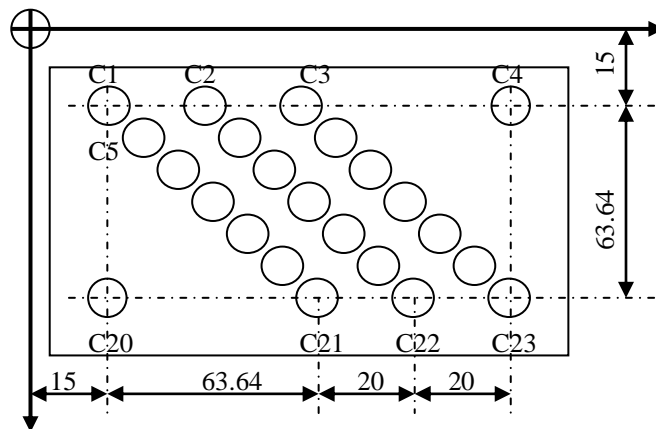
Hole to hole center distance is 15mm
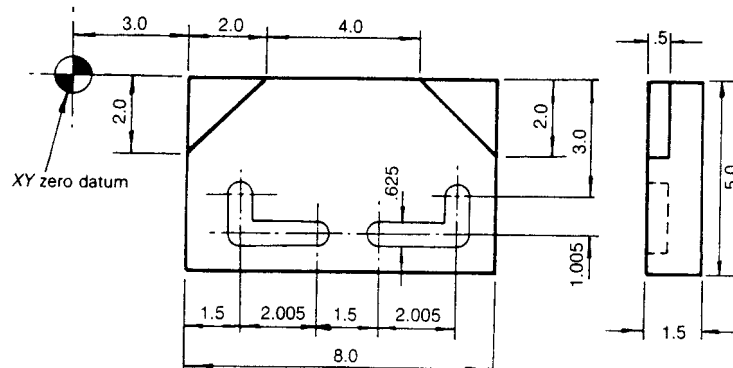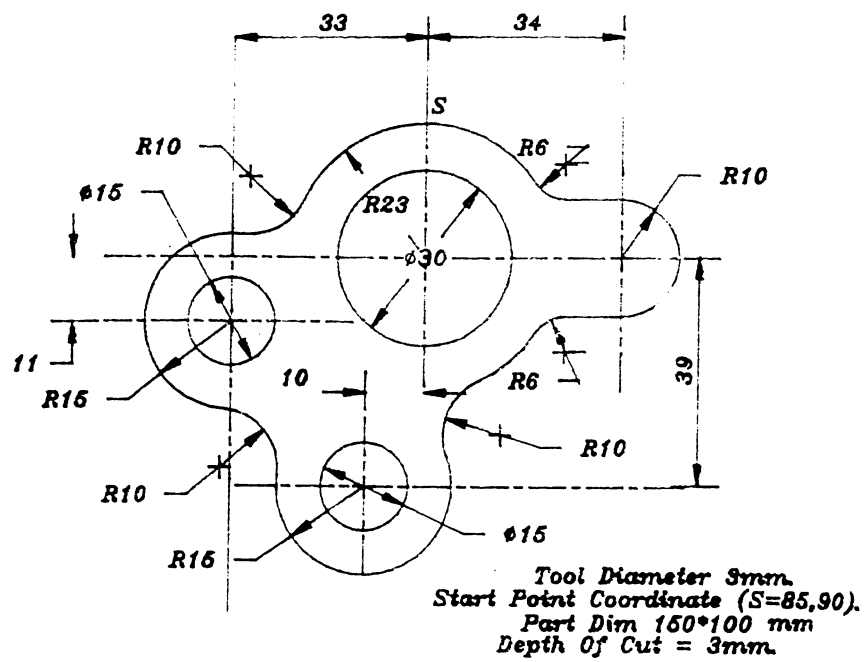All holes of Φ 5 mm

B)

C)

The machining sequence will be as follows :-
1) Mill top surface   2) Mill the stepped surface
3) drill the 4 holes 12ϕ 4) Mill the rectangular pocket 66x26x15
5) Mill the large hole 26ϕ

d) All dimension in Inch., Suggest the required tools.

e)

Tool Diameter 3mm.
Start Point Coordinate (S=85,90).
*Part Dim 150*100 mm*
Depth Of Cut = 3mm.

EMCO WinNC GE Series Fanuc 21mb

Description of G Commands

G00 Positioning (Rapid Traverse)

Format
N.... G00 X... Y... Z...

The slides are traversed at maximum speed to the programmed target point (tool change position, start point for a following machining routine)

Notes
- A programmed feed F will be suppressed while G00
- The maximum speed is defined by the producer of the machine
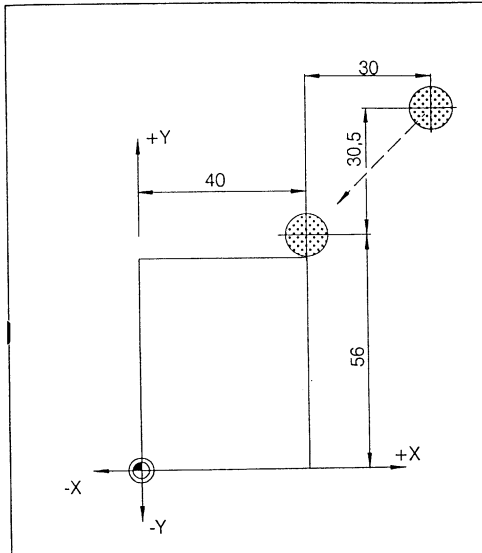- The feed override switch is active

Example

absolute G90
N50 G00 X40 Y56

incremental G91
N50 G00 X-30 Y-30.5

Absolute and incremental measures

G01 Linear Interpolation

Format
N... G01 X... Y... Z.... F....

Straight movements at the programmed feed rate.
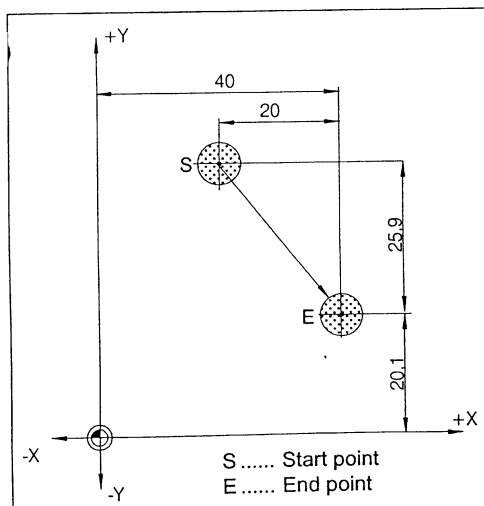
Example

absolute G90
N.. G94

.....
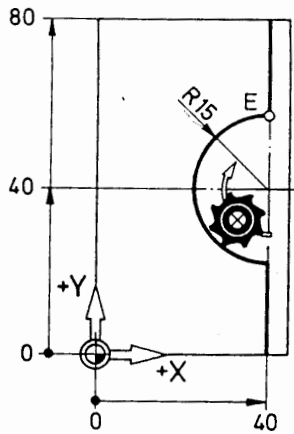N20 G01 X40 Y20.1 F500

incremental G91
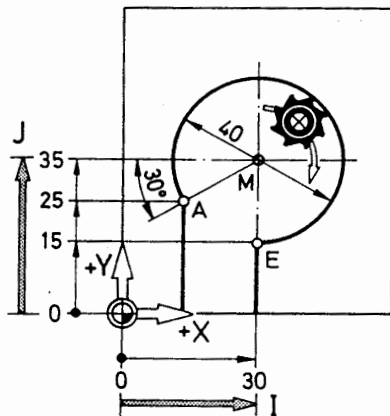N.. G94 F500

.....
N20 G01 X20 Y-25.9

S ...... Start point
E ...... End point

Absolute and incremental measures

EMCO

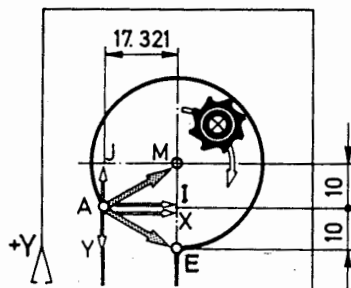# Milling arcs of circles in the plane G17 (summary)

Circle programming with R word:

N...   G42
N...   G1   Y25   F100
N... G2 X40 Y55   R15
N...   G1   Y87

Circle programming with absolute dimensions:

N...   G42
N...   G1   Y25   F100
N... G2 X30 Y15   I30   J35
N...   G1   Y-7

Circle programming with incremental dimensions:

N...   G42
N...   G1   Y25   F100
N...   **G91**
N... G2 X17.321 Y-10 I17.321
N...   **G90**