



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
JANUARY 2014 SESSION**

SUBJECT CODE : FFD 36103
SUBJECT TITLE : CNC TURRET PUNCHING PROGRAMMING
LEVEL : DIPLOMA
TIME / DURATION : 3.30 pm - 6.00 pm
(2.5 HOURS)
DATE : 28 MAY 2014

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. Please write your answers on the answer booklet provided.
4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
5. This question paper consists of TWO (2) sections. Section A and B. Answer ALL questions.
6. Answer all questions in English.
7. G- Code table is appended.

THERE ARE 6 PAGES OF QUESTIONS AND 1 PAGE OF G-CODE TABLE EXCLUDING THIS PAGE.

SECTION A (Total: 30 marks)**INSTRUCTION: Answer all questions.****Please use the answer booklet provided.****Question 1**

- (a) Write **FOUR (4)** steps in the programming procedures? (4 marks)
- (b) What is the function of *Air Regulator* in the Turret punching machine? (2 marks)
- (c) Describe what will happen when 'Q' is equal to '0' in Nibbling Arc (G68) in G code programming (2 marks)
- (d) Give **TWO (2)** functions of the '*MANUAL*' Mode in the Turret punching programming (2 marks)

Question 2

- (a) Why we must be doing '*origin position*' before starting and running the machine? (2 marks)
- (b) Write **FOUR (4)** assembly parts for the Punch assembly set at the B station. (2 marks)
- (c) List **FOUR (4)** types of standard cutting tool shapes in Turret Punching machine (2 marks)
- (d) What is the meaning of *dead zone* and why must we start a program at least 50 mm from the Y axis reference point in the programming? (2 marks)

Table 1: Die clearance data

MATERIAL THICKNESS	MILD STEEL	ALUMINIUM	STAINLESS
0.6-1.0mm	0.10 -0.15 mm	0.10-0.15 mm	0.15-0.20 mm
1.25-1.5 mm	0.2 -0.3 mm	0.20-0.25 mm	0.25-0.35 mm
2.0-2.5 mm	0.35 -0.45 mm	0.30-0.40 mm	0.45-0.55 mm
3 mm	0.5 -0.6 mm	0.45-0.50 mm	0.60-0.70 mm
4 mm	0.7 -0.8 mm	0.60 -0.70 mm	0.80 -0.90 mm
5 mm	0.8 - 1.0 mm	0.80 -0.90 mm	1.00 -1.15 mm
6 mm	1.0 -1.2 mm	0.90 -1.00 mm	1.10 -1.30 mm

- (e) From the table 1 above give two (2) conclusions that we can write from relation type of material and material thickness.

(2 marks)

Question 3

'The required force to punch the worksheet must not exceed the force of Turret punching machine in Arcade 210'. With this statement, calculate the equivalent tonnage to the problem below.

- a) Determine the tonnage that is needed to punch a rectangular hole of the size of 20 mm x 20 mm on a stainless steel plate with a thickness of 3 mm and a shearing strength of 60 kg/mm². Show your calculations.

(5 marks)

- b) Determine the tonnage that is needed to punch triangle shape in **Figure 1** on a mild steel plate with a thickness of 5 mm and a shearing strength of 40 kg/mm². Show your calculations.

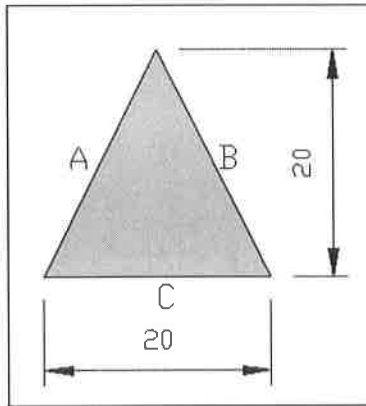


Figure 1: Triangle Shape

(5 marks)

SECTION B (Total: 70 marks)

INSTRUCTION: Answer 2 (two) questions only

Please use the answer booklet provided

Question 1

The G –Code program that you write must follow the sequence number. You are given the following tools;

- a) Round tool diameter 10 mm T2 ;
- b) Round tool diameter. 20 mm T11 ;
- c) Square tool 20 x 20 mm T19 ;
- d) Rectangle tool 30 x 3mm T16; (Auto-index)

From the above information, write a G-Code program for the drawing below;

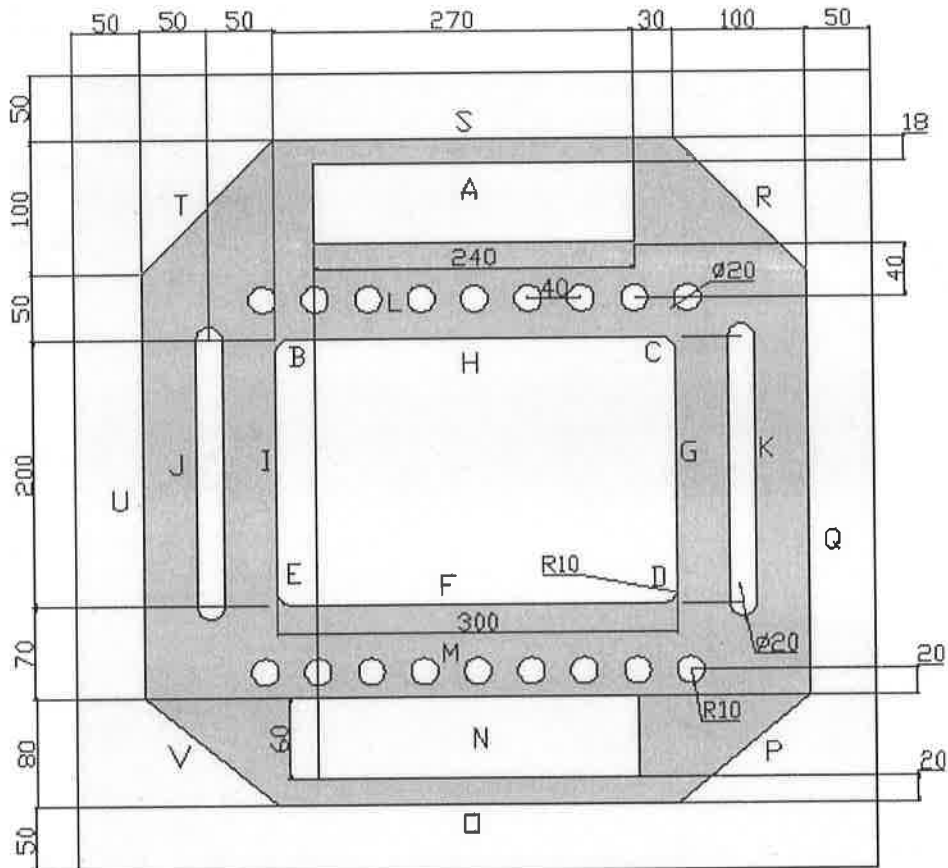


Figure 1: Bracket of door cabinet

Question 3

The G –Code program that you write must follow the sequence number. You are given the following tools;

- a) Round tool diameter 20 mm T10;
- b) Square tool 10 x 10 mm T12;
- c) Square tool 20 x 20 mm T19 ;
- d) Rectangle tool 3 x 30 mm T16; (Auto-index)

From the above information, write a G-Code program for the drawing below;

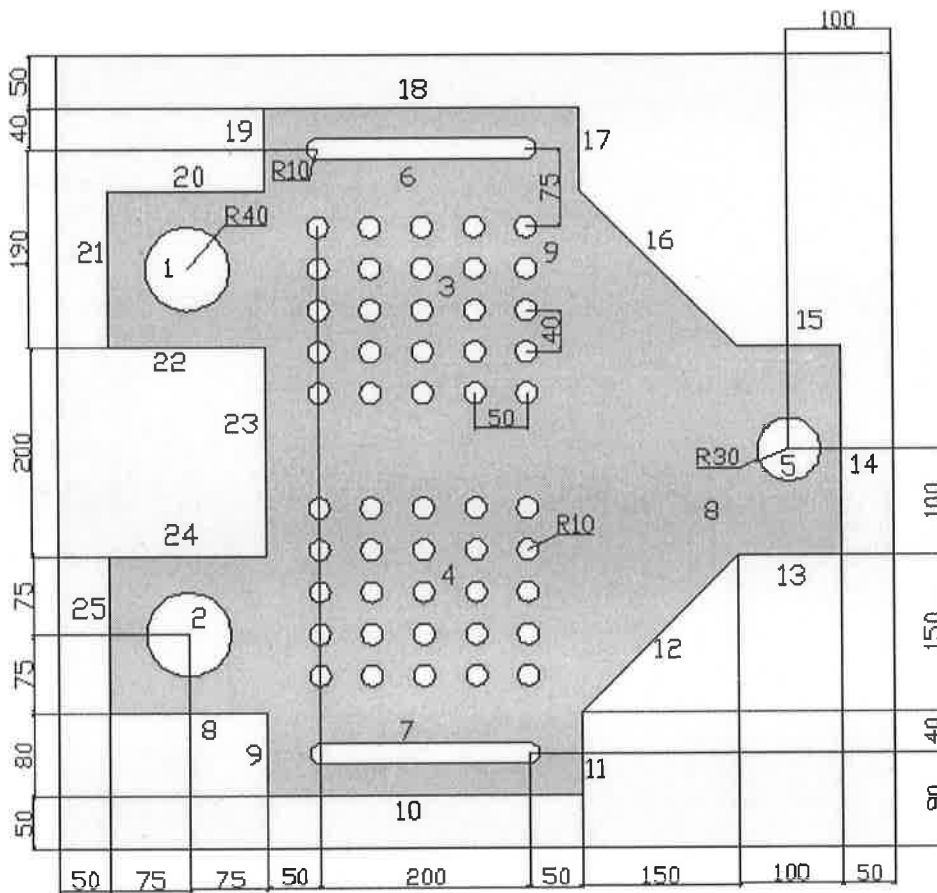


Figure 3: Bracket of plate

(35 marks)

END OF THE QUESTION

G 90

Absolute Point
X: Machine Site
Y: Value
T: Tool Number
C: Tool Angle

G 50

End of Program
And Return to Origin

G 98

Multipart
X: Reference Value x
Y: Reference Value y
I: Pitch along x
J: Pitch along y
P: Qty. of Intervals in x
K: Qty. of Intervals in y

G 73

Symmetry
X: Symmetry axis
Y: Symmetry axis
W: Macro Number (u,v)
Q: Qty. Q3x
Q4x,y

G 36

Holes on grid
I: X Increment
J: Y Increment
P: Holes No./x
K: Holes No./y
T: Tool Number
C: Tool Angle

G 68

Hibbling Arc
Thickness < 3.2mm
I: Radius
J: Initial Angle
K: Hibbling Angle
P: Position
Q: Pitch (step)

G 91

Increment Point
X: Value
Y: Value

G 05

Clamp Position
I: 1st. Clamp
J: X
K: 2nd. Clamp
Y: Value

G 70

Move Without Punch
X: Value
Y: Value

G 77

Macro Rotation
X: Reference
Y: Reference
J: Rotation Angle
W: Macro Number (u,v)

G 37

Holes on grid
Same as G 36

G 78

Hibbling Arc
Thickness > 3.2mm
Same as G 68

G 92

Begin of Program
X: Machine Site
Y: Machine Site

G 06

A: Thickness 0.8 to 6.4
B: Material
0: Steel
1: Stainless
2: Aluminum

G 25

Repositionment automatic
X: Reposition Value (1st. one)
Y: Value

G 26

Holes on Circle
I: Radius
J: Initial Angle
K: Qty. of holes
T: Tool Number
C: Tool Angle

G 66

Shear Proof
(Hibbling a Rectangle)
I: Cut Length
J: Angle (1,2)
K: Cut Width
P: Tool Length
Q: Tool Width
D: Micro Job
T: Tool Number
C: Tool Angle

G 69

Hibbling Line
Thickness < 3.2mm
I: Hibbling Length
J: Angle
P: Tool Diameter
Q: Pitch (step)
T: Tool Number
C: Tool Angle

G 93

Offset Value
X: Value
Y: Value

G 75

Multipart Recal/X
W: Macro Number (u,v)
Q: Starting Corner
Q1: Lower Left
Q2: Lower Right
Q3: Upper Left
Q4: Upper Right

G 27

Repositioning
X: Reposition Value (2nd. one and following)

G 28

Holes on Line
I: Distance between holes
J: Angle
K: Qty. of spaces
T: Tool Number
C: Tool Angle

G 67

Square Cut
I: X Length
J: Y Length
K: Tool Width
T: Tool Number
C: Tool Angle

G 79

Hibbling Line
Thickness > 3.2mm
Same as G 78

G 72

Pattern Origin
X: Value
Y: Value

G 76

Multipart Recal/Y
W: Value
C: Value

G 29

Holes on Arc
I: Radius
J: Initial Angle
P: Incremental Angle
K: Qty. of Holes
T: Tool Number
C: Tool Angle



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