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CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
JANUARY 2010 SESSION

SUBJECT CODE	:	FFD 36103
SUBJECT TITLE	:	CNC TURRET PUNCHING PROGRAMMING
LEVEL	:	DIPLOMA
TIME / DURATION	:	1.00pm – 3.30pm (2.5 HOURS)
DATE	:	03 MAY 2010

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 questions 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 4 PAGES OF QUESTIONS AND 1 PAGE OF G-CODE TABLE, EXCLUDING THIS PAGE.

SECTION A (Total: 50 marks)

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1

(a) List out four general precautions in determining the punching sequence of a Turret punching programming?

(8 marks)

(b) Why must the value of the punch and die clearance be check before running the machine?

(4 marks)

(c) List fiver types of special cutting tool in the *Turret Punching Machine*

(5 marks)

(d) Give two functions of the 'MDI' mode in the Turret punching programming.

(3 marks)

Question 2

(a) Write eight safety devices that are equipped on Arcade 210 to protect the operation against operational hazards and the machine from damage.

(8 marks)

(b) Describe what happen when G50 in the G code programming was not included.

(5 marks)

(c) What is your understanding for the meaning of '*Dead Zone Area* ' in Turret punching programming.

(5 marks)

(d) G 72 refers to the.....in CNC programming.

(2 marks)

Question 3

The required force to punch the worksheet must not exceed the force of machine Arcade *210*. The required punching force is obtained by the following formula:

$$P\ (\text{ton}) = \frac{A\ (\text{mm}) \times t\ (\text{mm}) \times r\ (\text{kg/mm})}{1000}$$

Where P: Force required

A: Length of cut edge

t : Thickness of worksheet

r : Shearing strength of worksheet

With the information given:

a) Determine the tonnage that is needed to punch holes with a diameter of 30 mm on a mild steel plate with a thickness of 6 mm and a shearing strength of 40 kg/mm. Show your calculations.

(5 marks)

b) 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/mm. Show your calculations.

(5 marks)

SECTION B (Total: 50 marks)

INSTRUCTION: Answer all questions.
Please use the answer booklet provided

Question 1

Base on the data given
Write a G-Code program for the drawing below.
The G –Code program that you write must follow the sequence number. You are given the following tools;

a) Round tool dia.20 mm T18;
b) Square tool 20 x 20 mm T19 ;
c) Rectangle tool 30 x 3mm T5; (Auto-index)

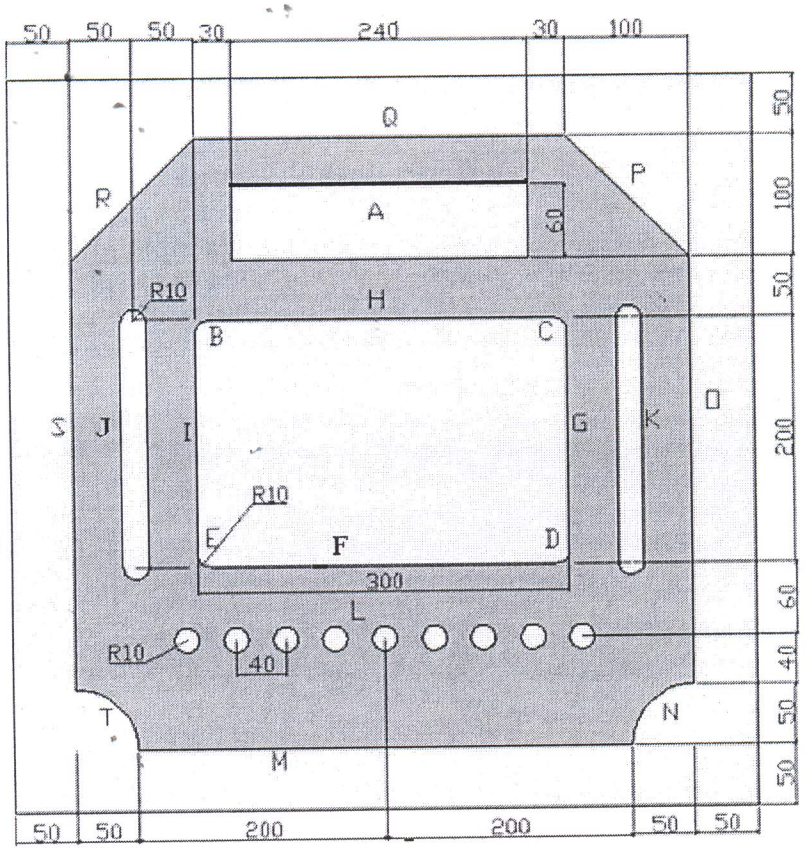


Figure 1: Cabinet bracket

(25 marks)

Question 2

Base on the data given:

Write a G-Code program for the diagram below.

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

a) Round tool diameter 20 mm T 18
b) Square tool 10 x 10 mm T 12.
c) Square tool 20 x 20 mm T 13.
d) Rectangle tool 30 x 3mm T5; (Auto-index)

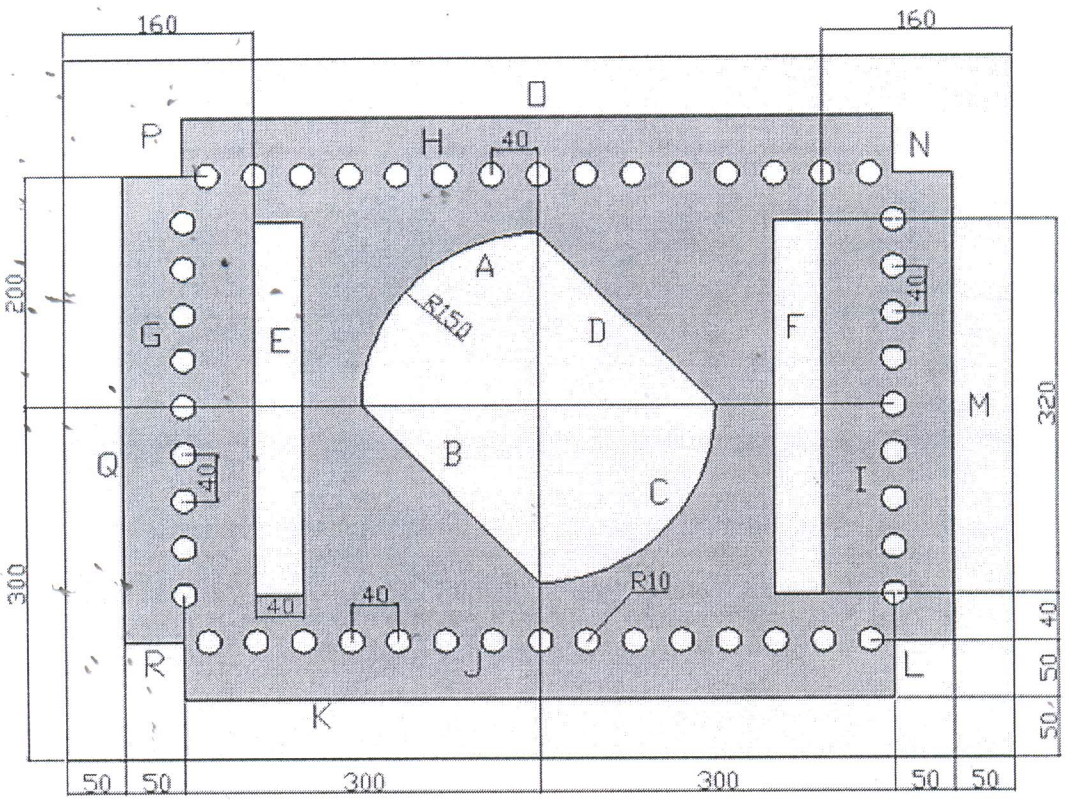


Figure 2: Base plate bracket

(25 marks)

END OF QUESTION

G 90

Absolute Point
X : Value
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 intervalles in x
K : Qty. of intervalles in y

G 73

Symmetry
X : Symmetry rel/x
Y : Symmetry rel/y
W : Macro Number (u,v)
Q : Q2/y Q3/x
Q4/x,y

G 36

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

G 68

Nibbling Arc
Thickness < 3.2mm
I : Radius
J : Initial Angle +,-
K : Nibbling Angle
P : Position +,-
Q : Pitch (step)

G 91

Increment Point
X Value
Y Value

G 05

Clamp Position
I = X 1st. Clamp
J = X 2nd. Clamp
K

G 70

Move Without Punch
X : Value
Y : Value

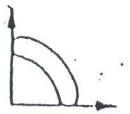
G 77

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

G 37

Holes on grid/y
Same as G 38

G 78



Nibbling Arc
Thickness > 3.2mm
Same as G 68

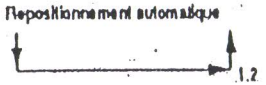
G 92

Begin of Program
X : Machine Size
Y : Machine Size

G 06

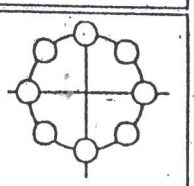
A : Thickness 0.8 to 6.4
B : Material
0 Steel
1 Stainless
2 Aluminium

G 25



Repositioning
X : Repos Value
(1st. one)

G 26

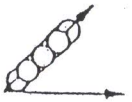


Holes on Circle
I : Radius +
J : Initial Angle +,-
K : Qty. of holes
T : Tool Number
C : Tool Angle

G 66

Shear Proof
(Nibbling a Rectangle)
I : Cut Length
J : Angle (+,-)
K : Cut Width
P : Tool Length +,-
Q : Tool Width +,-
D : Micro Join +,-
T : Tool Number
C : Tool Angle

G 69

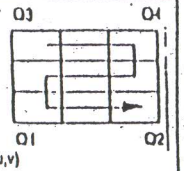


Nibbling Line
Thickness < 3.2mm
I : Nibbling Length +
J : Angle +,-
P : Tool Diameter +,-
Q : Pitch (step) +
T : Tool Number
C : Tool Angle

G 93

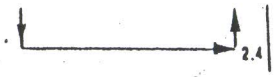
Offset Value
X : Value
Y : Value

G 75



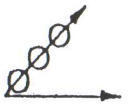
Multipart Recall/X
W : Macro Number (u,v)
Q : Starting Corner
Q1 : Lower Left
Q2 : Lower Right
Q3 : Upper Left
Q4 : Upper Right

G 27



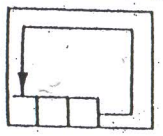
Repositioning
X : Repos Value
(2nd. one and following)

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

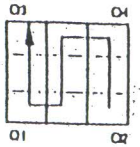
Nibbling Line
Thickness > 3.2mm

Same as G 79

G 72

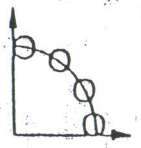
Pattern Origin
X : Value
Y : Value

G 76



Multipart Recall/Y
W
Q

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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