



UNIVERSITI KUALA LUMPUR
KAMPUS CAWANGAN MALAYSIAN SPANISH INSTITUTE

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : SFB36303 (V2)
COURSE TITLE : CNC TECHNOLOGY
PROGRAMME NAME : BACHELOR OF ENGINEERING TECHNOLOGY (HONS) IN
MANUFACTURING (AUTOMOTIVE)
DATE : 24 JANUARY 2026
TIME : 2:00PM - 5:00PM
DURATION : 3 HOURS

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. This question paper consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. Tick if applicable
9. Refer to the attached Formula/ Appendies. Tick if applicable

THERE ARE 10 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

Question 1

Answer all questions related to FAGOR CNC Lathe.

- (a) Refer to the figure. Write absolute and incremental coordinate systems from the reference point (0,0) until the endpoint (P8). Make a table of P0 – P8 coordinates in the X and Z axes for each of the coordinate systems.

Refer Below - Figure1 : Lathe Part .

(16 marks)

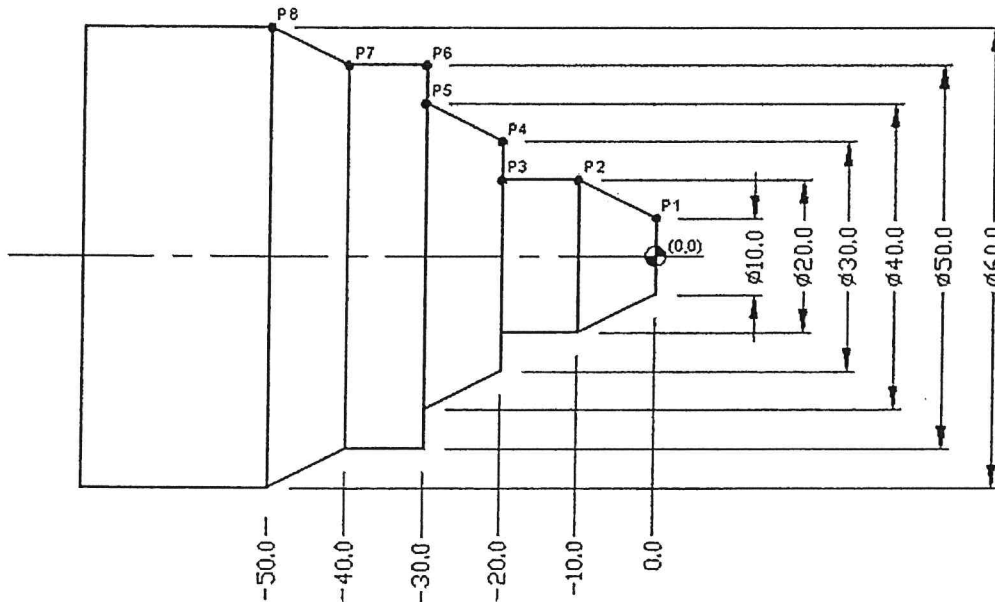


Figure 1: Lathe Part

- (b) Give the definition for Machine Reference Zero and Part Zero

(4 marks)

Question 2

Answer all questions related to FAGOR CNC machine controller.

- (a) CNC machining offers advantages not offered by conventional machines. Please describe **THREE (3) advantages** of CNC Machines compared to Conventional Machines.

(3 marks)

- (b) Explain the difference between functions of G36, G39 and G40 code in a CNC programming.

(3 marks)

- (c) Refer to the figure, and write absolute coordinate systems. Define all X-Y axis values. Make a table of P1-P6-P1 coordinates of the closed profile for each absolute coordinate system.
Refer Below - Figure2 : 1 .

(14 marks)

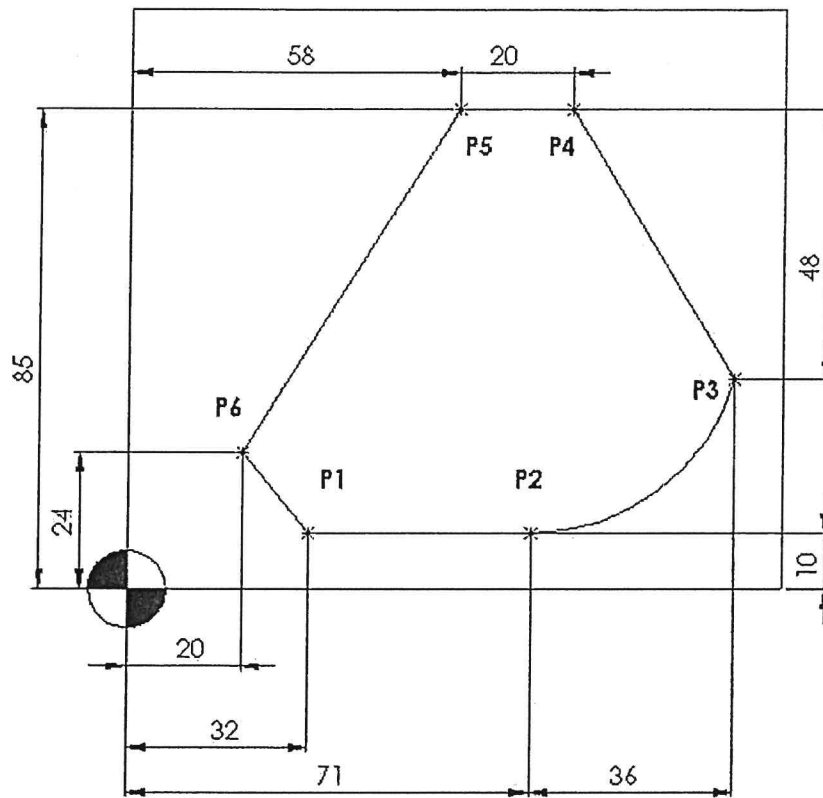


Figure 2: 1

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

Write a FAGOR CNC lathe program for the cutting path in the figure below. Start the cutting path on Part Zero.

Refer Below - Figure3 : Cutting path .

(20 marks)

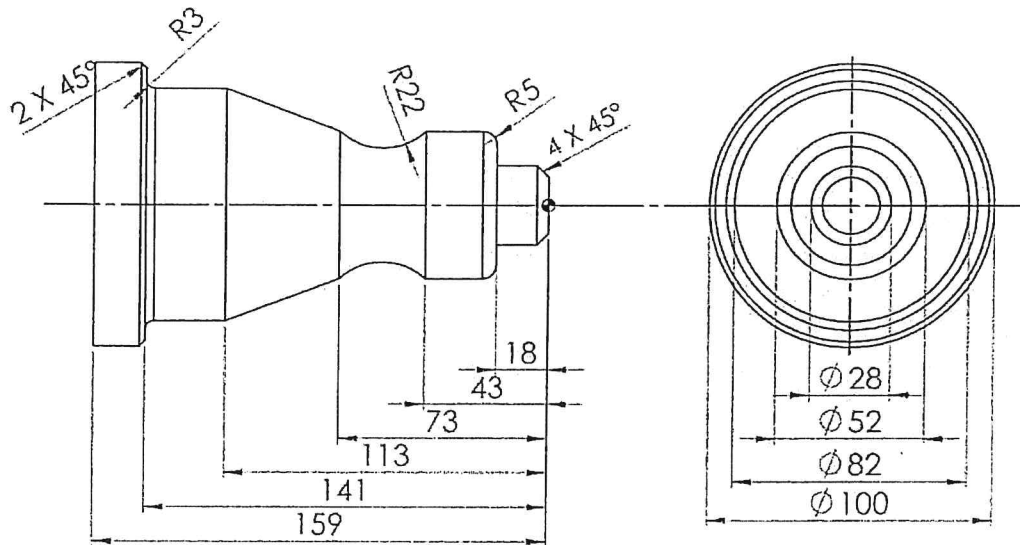


Figure 3: Cutting path

Question 2

Refer to the figure, and write a rectangular pocket canned cycle program to machine a 60x40mm pocket centered at (40,30) coordinates. The pocket surface is at Z0 and is to be emptied down to Z-20. The reference plane is located at Z3. Write your answer on the programming sheet given.

Rectangular pocket canned cycle: **G87 G98/G99 X Y Z I J K B C D H L V**

General information:

Positioning Type	: Absolute
Origin at	: Bottom left corner of the work piece
Main Plain	: X, Y.
T1D1	: Ø10 mm
Feed Rate	: 800 mm/min
Spindle Speed	: 1000 rpm

Canned cycle information:

Pocket depth	: 20 mm
Depth of pass	: 5 mm
The pocket corners size	: 10 mm
Milling pass or width	: 8 mm
Safety distance	: 2 mm
Feedrate during finishing pass	: 300 mm/min
Value of the finishing pass	: 2 mm
Penetrating Feed Rate	: 50 mm/min

Refer Below - Figure4 : Rectangle Pocket .

(20 marks)

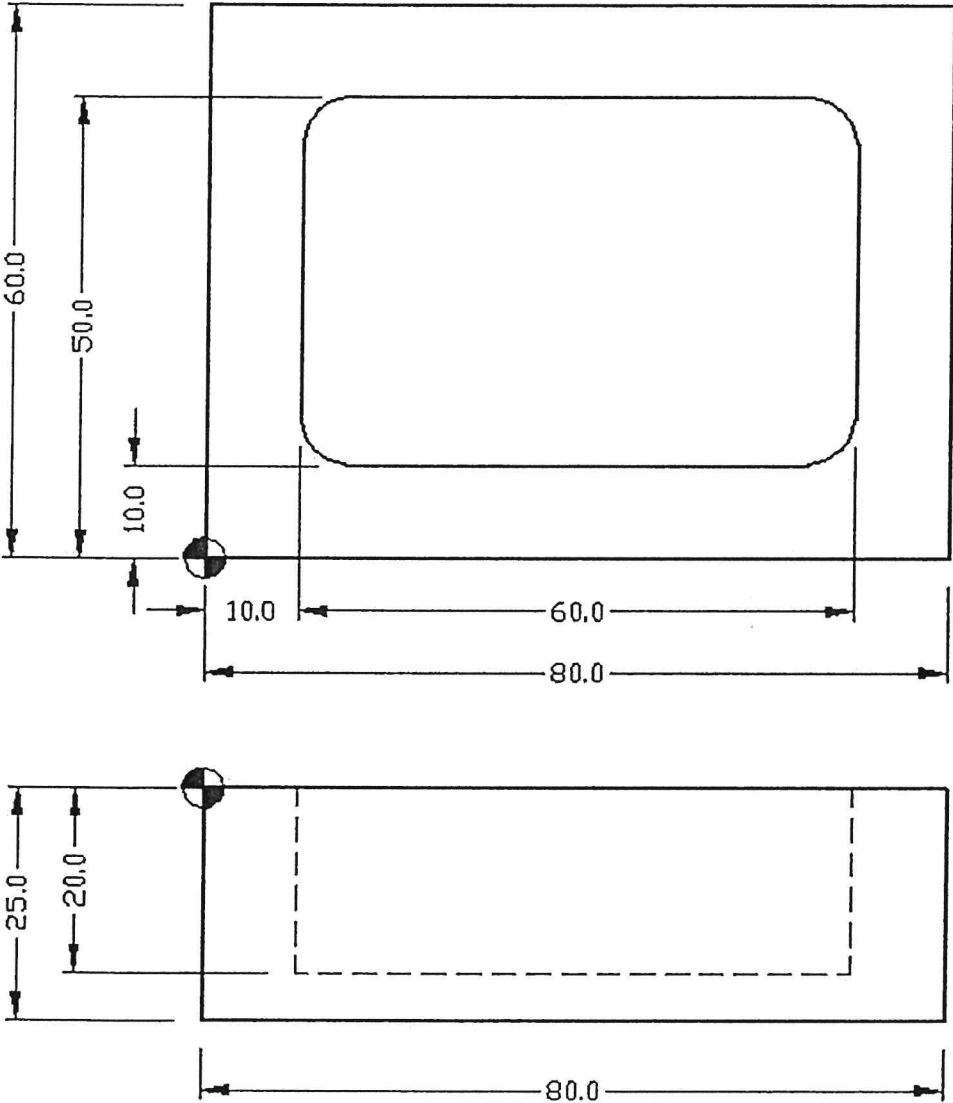


Figure 4: Rectangle Pocket

Question 3

Refer to the figure and given data below, and create a profile program for CNC machining milling by using absolute programming (G90) for the following profiles. The machining process should start in the sequence from P1. Write your answer on the programming sheet given.

Given data:

Raw material size : 15mm x 60mm x 60mm (Aluminum)
 Feedrate : 500 mm/min
 Spindle speed : T1 = 800 rpm, T2 = 1000rpm.
 Depth of cut : 5mm
 Penetration federate : 100 mm/min

Types of tools used

Tool T1 = End Mill Ø25 (Outside profile)
 Tool T2 = Drill Ø8.5 and the depth of drilling = 9mm

Refer Below - Figure5 : CNC Milling .

(20 marks)

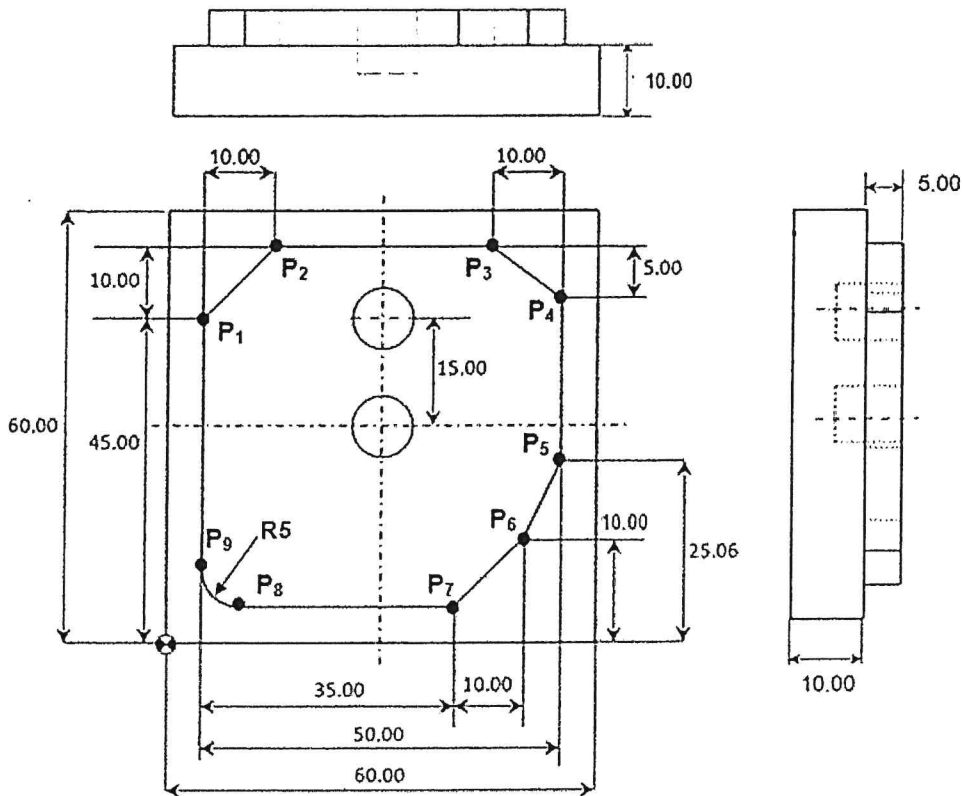


Figure 5: CNC Milling

Question 4

Figure below shows is a cylindrical part for CNC Lathe machining process. Answer all questions.

- i. Write absolute and incremental coordinate systems for P1 to P5 using CNC machining (lathe) as in the given table. (All dimension in mm)
Refer Below - Figure6 : CNC Lathe Part . Table1 : Coordinate X and Z .

(10 marks)

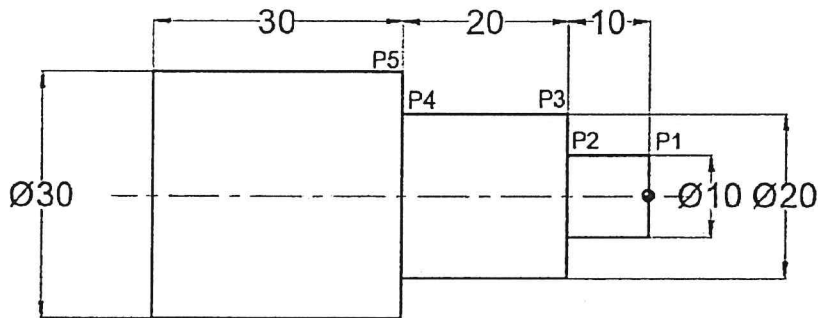


Figure 6: CNC Lathe Part

Table 1: Coordinate X and Z

Absolute (G90)			Incremental (G91)		
Point	X	Z	Point	X	Z
P1			P1		
P2			P2		
P3			P3		
P4			P4		
P5			P5		

- ii. Refer to figure below, you are given cylindrical part for machining using G68 (Stock removal cycle along X axis with format G68 X Z C D L M F H S E Q. Write a G68 programming into programming sheet.

Data given:

Material:	Mild Steel
Positioning plan:	G18
Material size:	Ø75mm X 135mm
Machining pass:	1.0mm
Safety Distance:	5.0mm
Finishing Stock Allowance:	0.5mm
Feed rate roughing:	30.0mm/min
Feed rate finishing:	40.0mm/min
Workpiece Rotation:	800RPM

Refer Below - Figure7 : Cylindrical Part .

(10 marks)

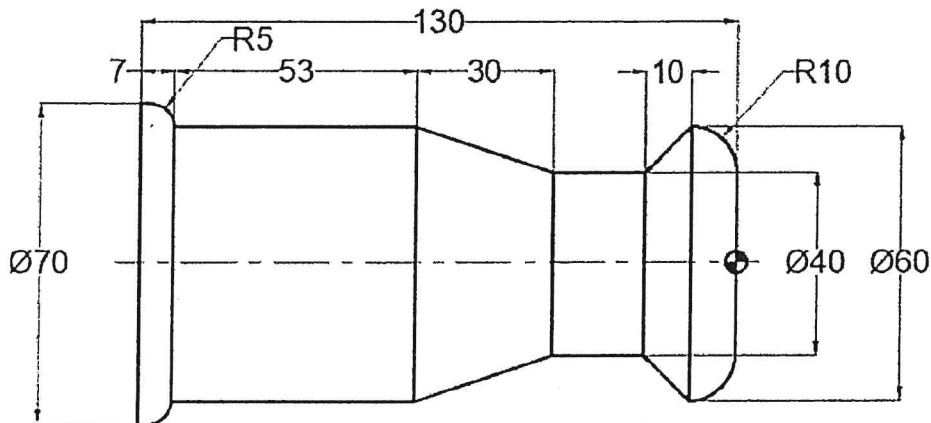


Figure 7: Cylindrical Part

END OF EXAMINATION PAPER

