UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DTM 1082
COURSE	: CNC PROGRAMMING
SEMESTER/SESSION	: 1-2022/2023
DURATION	: 2HOURS 30 MINUTES

Instructions:

1. This booklet contains 5 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 10 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Please **define** what is CNC programming. (4 marks)

b) **Name** and **describe** three (3) basic components of CNC machines. (6 marks)

c) **Describe** three (3) advantages and three (3) disadvantages of CNC machine. (6 marks)

d) Name two (2) example of machine controller for CNC machine (2 marks)

e) **What** is the rule used to determine the type of axis for computer numerical control machine? By sketching, describe these rules. (2 marks)

QUESTION 2

a) There are two (2) methods to determine coordinates/points in CNC programming, **what** are the methods? By sketching, describe these methods. (8 marks)

b) **What** primary role do preparatory (G codes and M codes) functions serve? (4 marks)

c) **Describe** these four (4) basic G codes, of the following function, sketch where appropriate. (4 marks)

i. G00
ii. G01
iii. G02
iv. G03

d) **Describe** these four (4) basic common M-codes of the following function, sketch where appropriate.

(4 marks)

i. End of program and rewind

ii. Coolant off .

iii. Optional stop.

iv. Spindle stop .

QUESTION 3

a) The given drawing (Figure 1), determine coordinates of all points **(Incremental and Absolute).** (20 marks)

*Please use Appendix 1 to **write** your answer.

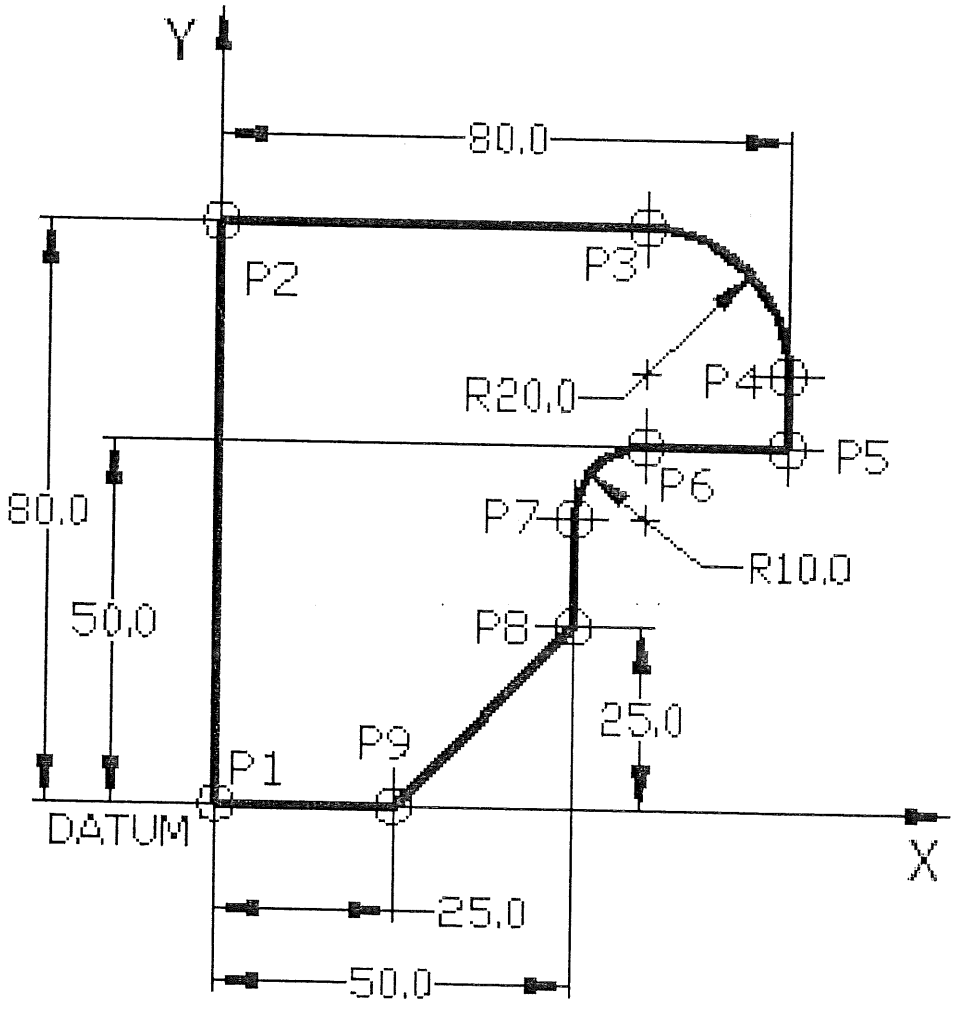

Figure 1

QUESTION 4

a) With the given drawing (Figure 2) and using **absolute mode**, **write** complete CNC programming for milling process. Please include spindle speed, feed rate, tool number and **depth -3.00 mm** in Z axis from the surface. (20 marks)

***Please use Appendix 2 to write your answer.**

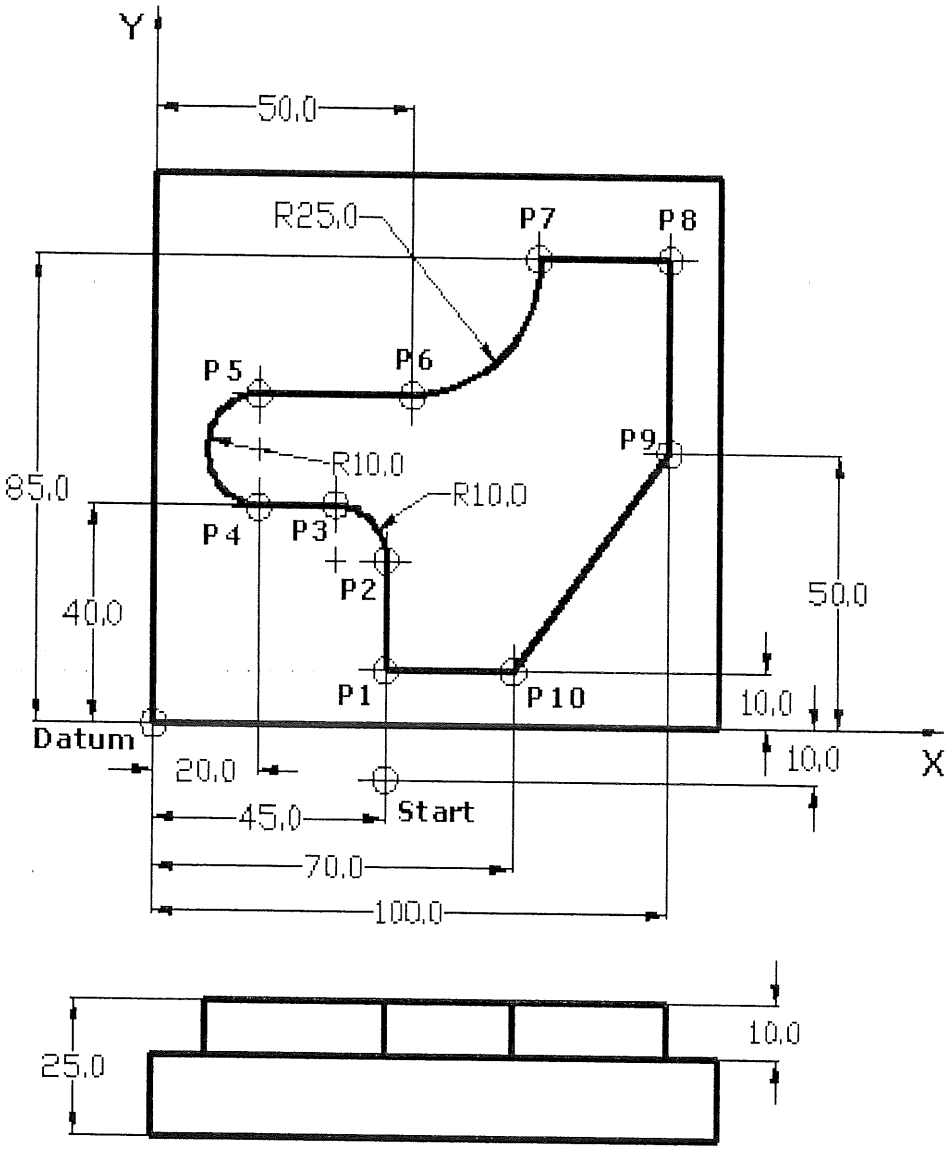

Figure 2

QUESTION 5

a) Given a description to every words for Fanuc Controller systems roughing and finishing cycle that use in Turning machine as below:

G71 = Straight roughing cycle
G7 I P .. Q .. U. . W .. F..
P: Start block to define start of profile
Q: End block to define end of profile
U: Stock allowance in X-axis.
W: Stock allowance in Z-axis.
F: Federate.

G70 = finishing cycle
G70 P .. Q. . F
P: Start block to define start of profile
Q: End block to define end of profile
F: Federate

Write a complete part program using **(Fanuc controller system)** for turning machine with address description given to create the Turning Roughing and finishing profile of the Raw material size Ø68 mm X 95 mm as shown in **Figure 3**. Please use the tool data shown in **Table 1.**

***Please use Appendix 3 to write your answer.**

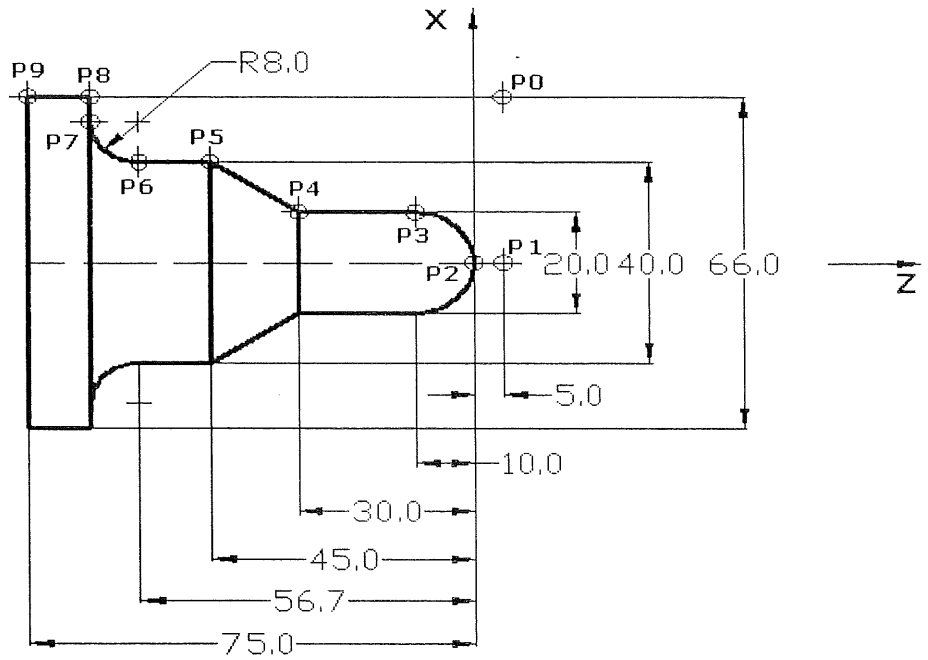

Figure 3. Part Turning process

Table 1. Parameter

Tool	Operation	Tool nose radius	Depth of cut	Speed (RPM)	F=mm/revolution
1	Roughing	Nose radius 0.8	D = 2mm	1500	F = 0.25
8	Finishing	Nose radius 0.4	D = 0.5 mm	2500	F = 0.15

----------End of question----------

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Criteria	Marks
All questions will be marked according to the answer scheme.	/100

APPENDIX 1

Answer sheet for Question no. 3

a) Absolute

P	X	Y	I	J
P1				
P2				
P3				
P4				
P5				
P6				
P7				
P8				
P9				
P1				

Incremental

P	X	Y	I	J
P1				
P1 to P2				
P2 to P3				
P3 to P4				
P4 to P5				
P5 to P6				
P6 to P7				
P7 to P8				
P8 to P9				
P9 to P1				

* Submit this paper together with answer script

APPENDIX 2

Answer sheet for Question no. 4

*** Submit this paper together with answer script**

APPENDIX 3

Answer sheet for Question no. 5

* Submit this paper together with answer script