

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Sixth Semester B.Tech (Hons.) Degree Examination June 2024 (2021 Admission)

**Course Code: MET398****Course Name: ADVANCED NUMERICAL CONTROLLED MACHINING****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

		Marks
1	Explain the structure of NC system with a diagram.	(3)
2	Compare the capabilities of ordinary and NC machine tools.	(3)
3	Discuss the basic differences between CNC and DNC.	(3)
4	How adaptive control works on a CNC machining?	(3)
5	Indicate X, Y and Z coordinates of vertical and horizontal CNC configurations using line sketch.	(3)
6	Detail the function of TOOL OFFSETS in CNC programming.	(3)
7	Explain G00, G01 and G02 codes with appropriate example	(3)
8	Explain a drilling canned cycles with the syntax.	(3)
9	Why preloading is done for ball screws? Discuss briefly.	(3)
10	Detail different tool holding arrangements used in CNC machines.	(3)

**PART B***Answer any one full question from each module, each carries 14 marks.***Module I**

- 11 a) Discuss the reasons that caused the transition from ordinary machine tools to NC machine tools. (8)
- b) Describe the structural configuration of CNC machining and turning centre. (6)

**OR**

- 12 a) Explain the advantages of CNC machines over ordinary machines. (6)
- b) Discuss the systems included in the CNC machines to improve the accuracy and productivity. (8)

**Module II**

- 13 a) Discuss the characteristics of open loop and closed loop control system of CNC machines with neat diagrams. (8)
- b) Explain part origin, machine origin and program origin for CNC programming with appropriate diagram. (6)

OR

- 14 a) Explain in detail about the types of CNC machines. (6)  
 b) Discuss the types and uses of encoders and interpolators in CNC system. (8)

**Module III**

- 15 a) Which are the methods for NC part programming? Discuss any two methods. (8)  
 b) Discuss the use of tool nose radius compensation feature in CNC. How is it programmed? (6)

OR

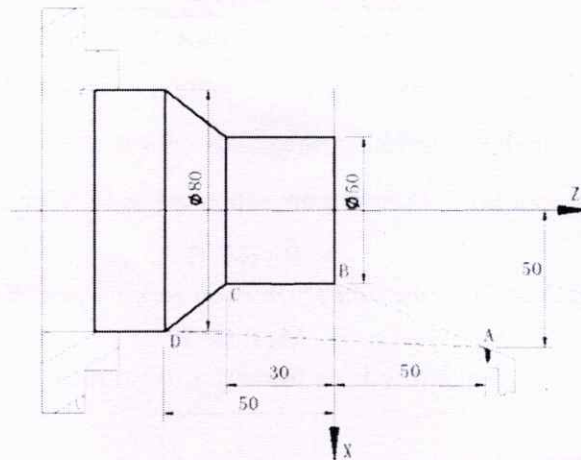
- 16 a) Explain Do loop and sub programs with examples. (6)  
 b) Detail various codes used in NC programming with descriptions. (8)

**Module IV**

- 17 a) Explain the types of statements used in APT language. Write a sample program. (8)  
 b) What are the features of post processors? How it helps the CNC machine to implement our design. (6)

OR

- 18 a) Write part program for the below work. Explain each block. (14)

**Module V**

- 19 a) Describe the principle of working of an automatic pallet changer and automatic tool changer. (8)  
 b) Describe with sketch the working and construction of recirculating ball screw used in CNC machine tools. (6)

OR

- 20 a) Explain the principles, types and uses of feedback systems used in CNC machine. (7)  
 b) Explain various design criteria to be considered in the design of spindle for CNC applications (7)

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