INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	CNC Milling Part Programming
Course Code	:	AME802
Class	:	VI Semester
Branch	:	MECHANICAL ENGINEERING
Year	:	2018–2019
Course Coordinator	:	Dr. K. Raghurammohan Reddy, Professor, Department of ME
Course Faculty	:	Dr. K. Raghurammohan Reddy, Professor, Department of ME

OBJECTIVES:

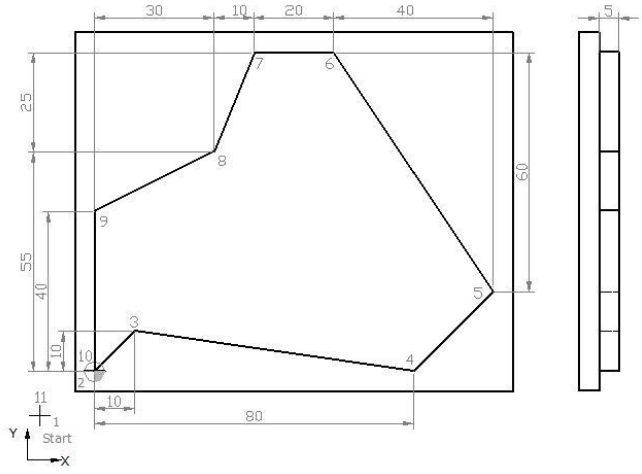
CNC Milling is a manufacturing process in which bars of material are held in a chuck and rotated while a tool is fed to the piece to remove material to create the desired shape. CNC lathes or turning centers have tooling mounted on a turret which is computer-controlled.

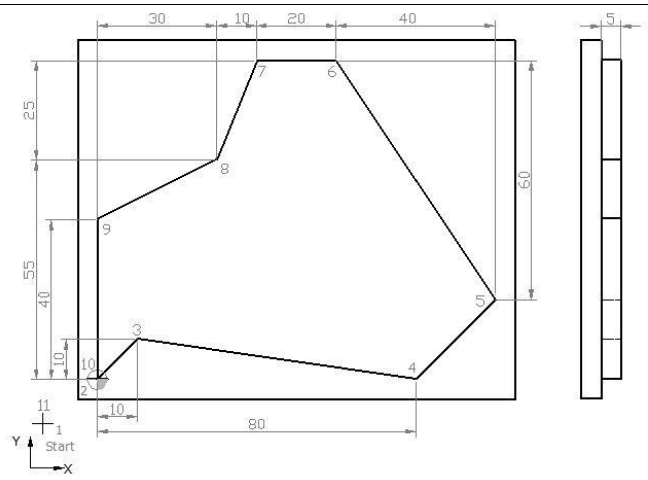
S No	QUESTION	Blooms Taxonomy level	Course Learning Outcomes
UNIT – I **INTRODUCTION TO AUTOMATION**			
Part - A (Short Answer Questions)			
1	Classify Automation system	Understand	AME802.01
2	Is Pneumatic Automation system comes under low cost or high cost automation?	Understand	AME802.02
3	Which automation system is better when deal higher loads and torques (Pneumatic Automation/Hydraulic Automation)?	Understand	AME802.01
4	What is the minimum operating pressure of Hydraulic systems?	Remember	AME802.01
5	What do you understand “Automation systems using programmable logic controllers”?	Understand	AME802.03
6	Write any 4 PLC applications	Understand	AME802.03
7	Write any 4 advantages of PLC	Understand	AME802.02
8	Describe the goals of automation	Understand	AME802.03
9	Explain the levels of automation in manufacturing	Remember	AME802.01
10	Distinguish between Hard and Soft automation	Understand	AME802.02
11	What are the chief advantages of Soft automation?	Understand	AME802.01
12	Define CAM	Understand	AME802.01
13	Compare CAM with the conventional Manufacturing systems	Understand	AME802.02
14	What are the benefits of CAM?	Understand	AME802.01
15	What are the CAM packages available today in the market?	Remember	AME802.03
16	Write the purpose of Numerical Control in CAD/CAM	Understand	AME802.04
17	List out the different numerical control modes.	Understand	AME802.01
18	Write any three miscellaneous functions codes.	Understand	AME802.02

19	List the different types of Practical NC machines	Remember	AME802.02
20	Write the purpose of a tool pre-setter	Understand	AME802.01
Part - B (Long Answer Questions)			
1	Define CAM	Understand	AME802.01
2	Compare CAM with the conventional Manufacturing systems	Understand	AME802.02
3	What are the benefits of CAM?	Understand	AME802.02
4	What are the CAM packages available today in the market?	Remember	AME802.03
4	Write the purpose of Numerical Control in CAD/CAM.	Understand	AME802.04
5	List out the different numerical control modes.	Understand	AME802.01
6	Write any three miscellaneous functions codes.	Understand	AME802.01
7	List the different types of Practical NC machines	Understand	AME802.02
8	Write the purpose of a tool pre-setter	Understand	AME802.03
9	List the elements of NC machine tool.	Remember	AME802.03
10	Write any three preparatory function codes.	Understand	AME802.02
11	What is the role of NC machines in CAM?	Understand	AME802.01
12	What is the role of CNC machines in CAM?	Remember	AME802.01
13	What is the role of DNC machines in CAM?	Understand	AME802.04
14	List out the benefits of NC machines.	Understand	AME802.01
15	List out the benefits of CNC machines.	Understand	AME802.01
16	List out the benefits of DNC machines.	Understand	AME802.04
17	What are the advantages of NC machines over conventional machines	Understand	AME802.01

UNIT-II
BASIC COMPONENTS OF CNC SYSTEM `

S No	QUESTION	Blooms Taxonomy Level	Course Learning Outcomes
1	What are the basic components of CNC systems?	Understand	AME802.05
2	Draw the block diagram of CNC system.	Understand	AME802.06
3	Explain the operational features of CNC machines with neat block diagram.	Understand	AME802.05
4	Explain the importance of CPU in CNC systems	Remember	AME802.06
5	How input devices are useful in CNC systems operation	Understand	AME802.07
6	What do you understand by the term programmable logic controller (PLC)	Understand	AME802.05
7	How servo control unit works for CNC systems	Understand	AME802.06
8	What is the function of Display control Unit in CNC systems?	Understand	AME802.05
9	Explain CNC part programming	Remember	AME802.06
10	How do you designate sequence number in a program	Understand	AME802.07
11	What is meant by Rapid Traverse?	Understand	AME802.05
12	What is meant by circular interpolation?	Understand	AME802.08

13	What is meant by linear interpolation?	Understand	AME802.06
14	How do you represent dimensions of the geometrical shape	Understand	AME802.05
15	Write a part program for a simple geometry of your own choice	Remember	AME802.06
16	What do understand by Preparatory codes?	Understand	AME802.07
17	What do understand by Miscellaneous codes?	Understand	AME802.08
18	What is meant by incremental system in part programs?	Remember	AME802.06
19	What is meant by absolute system in Part programs?	Understand	AME802.05
20	What is meant by fixed Zero and floating Zero in CNC part programming?	Understand	AME802.06
	Part - B (Long Answer Questions)		
1	What are the different sensors used in Machine Control Unit?	Understand	AME802.07
2	What are the different stepper motors used in Machine Control Unit?	Understand	AME802.05
3	What is the function of Servo motor in MCU?	Understand	AME802.06
4	What are the advantages of stepper motors in MCU?	Remember	AME802.05
5	What are the disadvantages of stepper motors in MCU?	Understand	AME802.06
6	What are the advantages of Servo motor in MCU?	Understand	AME802.07
7	What are the disadvantages Servo motor in MCU?	Understand	AME802.05
8	What is the function of Do-Loop in programming?	Understand	AME802.08
9	What is the function of sub in subroutine programming?	Remember	AME802.07
10	What are the different CNC machines used in present industry?	Understand	AME802.05
11	What are the different CNC machine control systems used in present industry?	Understand	AME802.06
12	Write the program for the given part below 	Understand	AME802.05

			
13	What is a CNC machine tool?	Understand	AME802.06
14	What are the 7 basic types of machine tools?	Understand	AME802.07
15	What is tool magazine in CNC machine?	Understand	AME802.05
16	Explain the historical development of CNC machine.	Understand	AME802.08
17	Explain the over view of present CNC machines with neat block diagram	Understand	AME802.07

UNIT-III

NC / CNC SYSTEMS

Part - A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy level	Course Learning Outcomes
1	Explain the Classification of NC machines	Understand	AME802.9
2	Explain the Classification of NC machines	Understand	AME802.10
3	How NC machines are classified based on the type of power to drive the NC systems	Understand	AME802.9
4	What do you mean by Electrical type power to the drive systems in NC machines	Remember	AME802.10
5	What do you mean by hydraulic type power to the drive systems in NC machines	Understand	AME802.9
6	What do you mean by pneumatic type power to the drive systems in NC machines	Understand	AME802.10
7	How NC machines are classified according to motion control system of slides	Understand	AME802.9
8	What is meant by Point- to – point system in NC system?	Understand	AME802.10
9	What is meant by Contour (or) continuous path system?	Remember	AME802.9
10	How NC machines are classified According to the feedback system	Understand	AME802.10
11	What do you mean by Open Loop Feedback system?	Understand	AME802.9
12	What do you mean by Closed Loop Feedback system?	Understand	AME802.10
13	How NC machines are classified According to the axis identification	Understand	AME802.10
14	What is meant by 2- axis?	Understand	AME802.11

15	What is meant by 3- axis?	Remember	AME802.11
16	What is meant by 4- axis?	Understand	AME802.12
17	What is meant by 5- axis?	Understand	AME802.9
18	What are the two main tasks of a part programmer in a computer assisted programming?	Understand	AME802.10
19	What do you understand by the term- defining the part geometry?	Understand	AME802.12
20	What do you understand by the term- specifying the tool path?	Remember	AME802.10
	Part – B (Long Answer Questions)		
1	What are the different methods of programming in CNC?	Understand	AME802.09
2	What is meant by manual part program?	Understand	AME802.10
3	What is meant by computer assisted part program?	Understand	AME802.10
4	What is meant by MDI?	Remember	AME802.11
5	What is meant by ATC?	Understand	AME802.11
6	List the various types of architectures associated to CNC Machines	Understand	AME802.12
7	Explain Open Architecture Controller in CNC machines	Understand	AME802.9
8	Explain Hardwired Architecture Controller in CNC machines	Understand	AME802.10
9	Explain soft-wired Architecture Controller in CNC machines	Remember	AME802.12
10	What are the specifications associated to Open Architecture Controller in CNC machines?	Understand	AME802.10
11	Explain Open Modulate Architecture Controllers with neat Sketch	Understand	AME802.9
12	Explain Hierarchical Open Architecture Multi-processor - CNC	Understand	AME802.10
13	Explain Open System Environment for Controller	Understand	AME802.10
14	What are the characteristics of open architecture CNC?	Understand	AME802.11
15	What are the benefits of the open architecture controller?	Remember	AME802.11
	UNIT-IV **MACHINE TOOLS CLASSIFICATION OF NC / CNC SYSTEMS**		
	Part – A (Short Answer Questions)		
S No	**QUESTION**	**Blooms Taxonomy Level**	**Course Learning Outcomes**
1	What is machine control unit?	Understand	AME802.13
2	What is the purpose of the machine control unit?	Understand	AME802.14
3	What are the basic components of NC system?	Understand	AME802.13
4	What are the parts of CNC machine?	Remember	AME802.14
5	What is Data Processing Unit?	Understand	AME802.13
6	What is Control Loop Unit?	Understand	AME802.14
7	What is machine setting and correction in CNC?	Understand	AME802.13
8	What is work offset in CNC machine?	Understand	AME802.14

9	What is the purpose of a computer numerical control (CNC) milling machine?	Understand	AME802.13
10	What is a CNC machine and its operation?	Understand	AME802.14
11	What are the limitations of CNC machine tools?	Understand	AME802.13
12	What is the multivariable control system of a CNC machine?	Remember	AME802.14
13	What is the difference between CNC Turning Center and CNC Lathe Machine?	Understand	AME802.13
14	What is a CNC machine? How do I build a CNC machine?	Understand	AME802.14
15	How isit working with CNC machines?	Understand	AME802.13
16	What i a vertical CNC machine?	Understand	AME802.14
17	How do I control availability in the CNC machining process?	Remember	AME802.13
18	Which microcontroller is used in a professional CNC machine?	Understand	AME802.14
19	What is a coolant in a CNC machine?	Understand	AME802.13
20	What are the components of CNC machine? Which motor is used in CNC?	Understand	AME802.14
	Part – B (Long Answer Questions)		
1	What is a CNC turning machine?	Understand	AME802.14
2	Explain the Functions of the control unit	Remember	AME802.13
3	Explain the Hardwired control unit	Understand	AME802.14
4	Explain the Microprogram control unit	Understand	AME802.13
5	Explain the functions of CNC interpolators	Understand	AME802.14
6	Explain linear interpolation with neat sketch	Understand	AME802.13
7	Explain circular interpolation with neat sketch	Remember	AME802.14
8	Explain helical interpolation with neat sketch	Understand	AME802.13
9	Explain parabolic interpolation with neat sketch	Understand	AME802.14
10	Explain cubic interpolation with neat sketch	Understand	AME802.13
11	What are the sequential controllers associated to CNC Machines	Understand	AME802.14
12	What is a CNC turning machine?	Understand	AME802.13
13	Explain the Functions of the control unit	Remember	AME802.14
14	Explain the Hardwired control unit	Understand	AME802.13
15	Draw the block diagram of the MCU of CNC machine	Understand	AME802.14
	UNIT-V **PART PROGRAMMING**		
Part - A (Short Answer Questions)			
1	What is a part program?	Understand	AME802.15
2	What are the elements of associated to CNC part program?	Understand	AME802.16
3	What are the advantages of Manual part programming?	Understand	AME802.15
4	What are the limitations of Manual part programming?	Remember	AME802.16
5	What are the advantages of Computer assisted art Programming?	Understand	AME802.15
6	What is EAPT?	Understand	AME802.17

7	What is meant by APT?	Understand	AME802.15
8	What are the functions of Computer assisted art programming?	Understand	AME802.16
9	What is cutter compensation?	Remember	AME802.15
10	What are four basic types of statements in the APT language?	Understand	AME802.17
11	What is meant by Geometry statements in APT?	Understand	AME802.15
12	What is meant by Motion commands in APT?	Understand	AME802.16
13	What is meant by Postprocessor statements in APT?	Understand	AME802.17
14	What is meant by Auxiliary statements in APT?	Understand	AME802.16
15	What is Macro statement in APT. Explain with suitable Example?	Remember	AME802.15

Part - B (Long Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Learning Outcomes
1	What is a part program?	Understand	AME802.15
2	What the elements are of associated to CNC part program?	Understand	AME802.16
3	What are the advantages of Manual part programming?	Understand	AME802.15
4	What are the limitations of Manual part programming?	Remember	AME802.17
5	Discuss the advantages of Computer assisted art programming	Understand	AME802.15
6	Expand APT	Understand	AME802.16
7	Explain briefly about APT.	Understand	AME802.15
8	Discuss in detail about various functions of Computer assisted art programming?	Understand	AME802.16
9	What is cutter compensation?	Remember	AME802.15
10	Describe four basic types of statements in the APT language?	Understand	AME802.17
11	What is meant by Geometry statements in APT?	Understand	AME802.15
12	What is meant by Motion commands in APT?	Understand	AME802.16
13	What is meant by Postprocessor statements in APT?	Remember	AME802.15
14	What are Auxiliary statements in APT?	Understand	AME802.17
15	What is Macro statement in APT. Explain with suitable example?	Understand	AME802.15

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