GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019

Subject Code: 2172002/2172010   **Date: 26/11/2019**
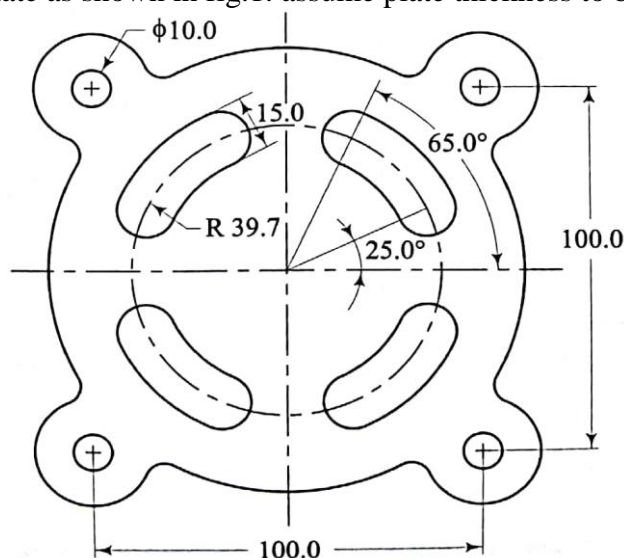
Subject Name: Automated Manufacturing - I

Time: 10:30 AM TO 01:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What is programmable automation and what are some of its features?	**03**
	(b)	What is the difference between hard product variety and soft product variety ?	**04**
	(c)	The following component is to be made using a CNC machining Centre equipped with a FANUC controller. Write a complete manual part program for machining the holes and slots in the plate as shown in fig.1. assume plate thickness to be 10 mm.	**07**

All Dimension are in mm
Fig 1.

Q.2	**(a)**	List ten stratergies for automation and process improvement.	**03**
	(b)	Explain the meaning of numerical control. What are the areas where numerical control can be used?	**04**
	(c)	Discuss the salient features of point to point, straight line and contouring CNC systems.	**07**

OR

	(c)	Explain the use of following codes for CNC turning center:	**07**
		(i) G00, G01, G02,G04	
		(ii) G71, G72, G73, G70	
		(iii) M02, M03, M05, M30	
		(iv) G92, G76, G32	

Q.3	**(a)**	What do you understand by machine zero and work zero? Explain.	**03**
	(b)	What is the need of recirculation of rolling elements in LM guideways and ballscrews?	**04**
	(c)	What are the factors considered while designing the structure of a CNC machine?	**07**

OR

Q.3	**(a)**	Explain Automatic Tool Changer(ATC) in CNC machine.	**03**

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	(b)	Explain the difference between G71 rough turning cycle and G72 rough facing cycle in CNC turning machine.	**04**
	(c)	Using neat sketches, explain the working principle of incremental and absolute optical encoders.	**07**

Q.4	**(a)**	What is CMM ? Explain.	**03**
	(b)	Differnace between forword engineering and reverse engineering.	**04**
	(c)	What is forward sensing in AGVs Terminology?	**07**

OR

Q.4	**(a)**	Name the various guidance methods available for automated guided vehicle(AGV).	**03**
	(b)	Explain different types of AGV.	**04**
	(c)	Difference between an AS/RS and Carousel storage system.	**07**

Q.5	**(a)**	Explain the steps of RP techniques.	**03**
	(b)	Difference between rail-guided vehicles and automated guided vehicles.	**04**
	(c)	Explain carousel storage systems. Write down its application.	**07**

OR

Q.5	**(a)**	Write down application of 3D printer.	**03**
	(b)	Classification of rapid prototyping processes.	**04**
	(c)	Types of AS/RS systems. Explain in details.	**07**

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