Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2171903 **Date: 03/12/2019**

Subject Name: Computer Aided Manufacturing

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.**
4. **Abbreviations have usual meaning.**

Q.1 **(a)** Give three points each on advantages and disadvantages of CAM. **03**

(b) Draw the CIM wheel to understand basic functions. **04**

(c) Explain closed-loop control system used in a CNC system with a schematic diagram (include its limitation and application). Draw a block diagram of position control loop for a closed-loop control system. **07**

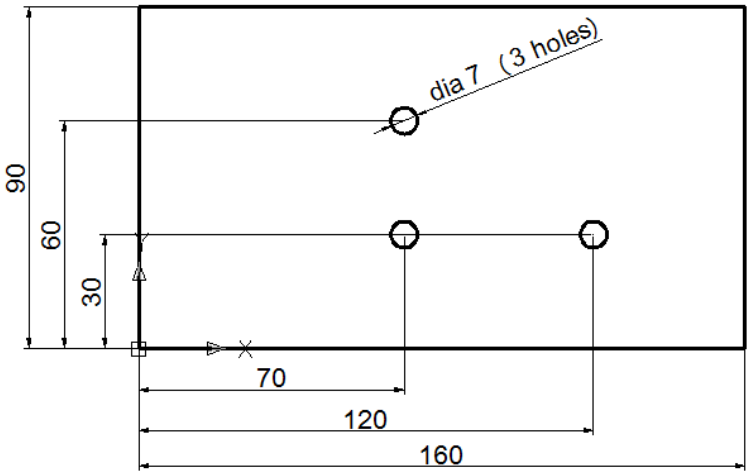
Q.2 **(a)** What is meant by the term 'group technology'? **03**

(b) Brief about 'continuous path control' used in a CNC machine tool system. **04**

(c) Explain the 'stick-slip phenomenon' encountered in conventional friction guideways. How is it overcome with the use of anti-friction guideways? **07**

OR

(c) Write an NC part program for drilling three holes in the plate shown in Figure 1. Work material is a machinable grade of alluminium 10-mm thick. Specify the cutting tool and describe your procedure for this task. Feed and cutting speed for the work material are 0.05 mm/rev and 0.37 m/sec respectively. Show interpretation of each block you write in a remark column. **07**



Dimensions in mm

Figure 1

Q.3 **(a)** Enlist the four major components an FMS is comprised of. What is the role of humans in it? **03**

(b) Why are various layout types in FMS made available to choose from? Enlist the types and draw schematic diagram of any one layout. **04**

(c) Write a note on: Automated Storage and Retrieval System (AS/RS). **07**

OR

Q.3 **(a)** Define PLC. Brief about the relay device components used in it. **03**

	(b)	State points on 'role of management in CAM'.	**04**
	(c)	Explain generative type CAPP system using a block diagram.	**07**
Q.4	**(a)**	In which two categories the actuation systems employed for robots can be distinguished? State the application area or environment in which each of these could be used.	**03**
	(b)	Enlist the general characteristics of a work-situation which promotes the use of robots.	**04**
	(c)	Describe the methods for programming robots. What are the advantages of each method?	**07**

OR

Q.4	**(a)**	Explain the PLC architecture using a diagram.	**03**
	(b)	Brief about 'cellular manufacturing'.	**04**
	(c)	Provide a comprehensive list of robot specifications with regard to (a) manipulator and (b) controller.	**07**
Q.5	**(a)**	What do you understand by MRP-II? What does the acronym ERP stand for?	**03**
	(b)	Draw the structure of an MRP system.	**04**
	(c)	Write a note on: Different types of flexibility required in an FMS.	**07**

OR

Q.5	**(a)**	In block number 80 of a part program a clockwise circular interpolation is required to the target point (25.40, 12.50, --10.00) with feed rate 150 mm/min and spindle on. Write this block in fixed sequential format, tab sequential format and word address format. (Coordinates are in millimeters)	**03**
	(b)	Explain with reference to CNC machining: tool nose-radius compensation is a must for taper- and radius-turning, whereas it is not required while turning straight cylindrical surface.	**04**
	(c)	Elaborate the 'Just in Time' manufacturing philosophy along with its goals. How could these goals be achieved?	**07**

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