Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE –SEMESTER VII (NEW SYLLABUS)EXAMINATION- SUMMER - 2018

Subject Code: 2171903 Date: 05/05/2018

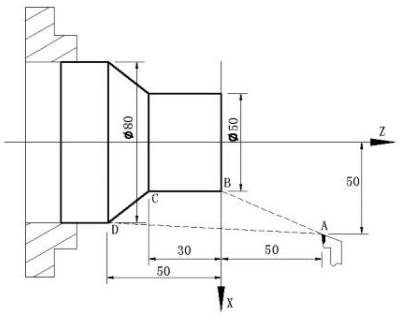
Subject Name: COMPUTER AIDED MANUFACTURING

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

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

			MARKS
Q.1	**(a)**	Justify the need of CAM in today's era.	**03**
	(b)	Classify CNC machine based on its tool motion and control system used.	**04**
	(c)	Draw CIM wheel and discuss different aspect of CIM	**07**
Q.2	**(a)**	What is modal and non-modal code? Give example of each.	**03**
	(b)	Explain use of recirculating ball screw and linear guide in CNC machine.	**04**
	(c)	Write a part program for the given forged component to turn the profile.	**07**



OR

	(c)	List various feedback devices used in CNC machine. Explain working principle of Rotary encoder with neat sketch.	**07**
Q.3	**(a)**	Explain incremental and absolute dimensioning with neat sketch.	**03**
	(b)	Explain the axes designation rules for machine tools employing rotating tools. Sketch a vertical machining center and designate its axes.	**04**
	(c)	List component of AS/RS system. Explain function of each component in AS/RS. Discuss importance of AS/RS in FMS.	**07**

OR

Q.3	**(a)**	List benefits of Group Technology.	**03**
	(b)	Explain concept of composite part in GT.	**04**
	(c)	Discuss need of FMS. List and explain different types of flexibilities with reference to FMS concept.	**07**
Q.4	**(a)**	List various power source, transducers used in robot arm.	**03**
	(b)	What is AGV? Explain working principle of AGVs.	**04**

(c) Explain different types of FMS layouts with their application. **07**

OR

Q.4 **(a)** Describe the terms with reference to Robot: 1. Payload, 2. Work envelop, 3. Wrist motions: Roll, Pitch and Yaw **03**

(b) What is PLC? List and discuss its applications in various industries. **04**

(c) Select a Robot configuration for loading and unloading a part from CNC turning center and place it in a rack near to the machine. Draw neat sketch of the configuration and define degree of freedom of each joint. Assume suitable data as required. Also justify your selection over other options. **07**

Q.5 **(a)** What is the objective of MRP 1? List its benefits. **03**

(b) Explain concept of JIT. List various advantages of JIT in manufacturing. **04**

(c) Suppose that four machines, 1, 2, 3, and 4 have been identified as belonging in a GT machine cell. An analysis of 50 parts processed on these machines has been summarized in the From-To chart presented below. Additional information is that 50 parts enter the machine grouping at machine 3, 20 parts leave after processing at machine 1, and 30 parts leave after machine 4. Determine a logical machine arrangement using Hollier method.Draw the flow diagram indicating flow of parts into and out of the cells. **07**

From-To Chart

	To:	1	2	3	4
From:	1	0	5	0	25
	2	30	0	0	15
	3	10	40	0	0
	4	10	0	0	0

OR

Q.5 **(a)** Product P is assembled out of 2 units of S1 and 1 unit of S2. Both S1 and S2 are subassemblies. S1 is made of 2 unit of C1 and 2 units of C3. S2 is made of 1 units of C1 and 2 unit of C2. Draw product tree structure diagram. **03**

(b) What is Part Family? List different methods used to make part families and explain each in brief. **04**

(c) What is CAPP? List various CAPP systems and explain any one in detail. **07**

List of G and M code:

G00 Rapid traverse
G01 Feed rate traverse
G02 Clockwise Circular Interpolation
G03 Anti Clockwise Interpolation
G90 Absolute Mode
G91 Incremental mode
G95 mm/rev feed rate
G94 mm/min feed rate

M02 End of Program
M03 Spindle on (CW)
M04 Spindle on (CCW)
M05 Spindle Stop
M06 Tool change
M08 Coolant on
M09 Coolant off
M30 Program stop and rewind