GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII(OLD) • EXAMINATION – WINTER 2016

Subject Code: 171903   **Date: 23/11/2016**
Subject Name: Computer Integrated 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.**

Q.1	**(a)**	Discuss components of FMS.	**07**
	(b)	Discuss axes designations of NC/CNC machines in detail giving suitable example.	**07**
Q.2	**(a)**	(i). Enlist types of NC machine tools on the basis of capability with reference to slide control.	**02**
		(ii). Differentiate between point to point (P type) and line cutting (L type) NC systems giving suitable example.	**05**
	(b)	Define CIM. Discuss the concept of CIM wheel.	**07**

<div align="center">OR</div>

	(b)	(i). Enlist the various types of manufacturing.	**02**
		(ii). Discuss the similarities and differences of batch production and job-shop production system.	**05**
Q.3	**(a)**	Discuss OPTIZ part classification and coding system.	**07**
	(b)	Discuss principle of operation of various types of tape readers.	**07**

<div align="center">OR</div>

Q.3	**(a)**	Discuss the concept of part family and composite part with reference to group technology.	**07**
	(b)	(i). Discuss the concept of absolute and incremental programming giving suitable example.	**04**
		(ii). Define canned cycle with the help of canned cycle for drilling G81.	**03**
Q.4	**(a)**	(i). Enlist various types of grippers used in robots.	**02**
		(ii). Discuss detail construction of any one type of gripper along with its applications, advantages and limitations.	**05**
	(b)	(i). Name various robot configurations.	**03**
		(ii). Discuss Cartesian and SCARA configuration with the help of suitable sketches.	**04**

<div align="center">OR</div>

Q.4	**(a)**	Discuss various types of robot joints along with its characteristics.	**07**
	(b)	Discuss retrieval type of CAPP along with information flow.	**07**
Q.5	**(a)**	Write manual part program for machining of the component shown in figure 1. Assume raw product as a cast iron and machining is to achieve the various dimensions as shown in figure 1. Drill and milling cutter to be used is of diameter 10 mm. Assume spindle speed for drilling and milling as 575 rpm and 480 rpm respectively. Assume feed rate as 115 mm/min and 290 mm/min for drilling and milling respectively.	**07**

(b) Write APT geometry and motion commands to machine the component shown in figure 2. Assume diameter of milling cutter used as 10 mm, spindle speed as 800 rpm and feed rate as 240 mm/min.   **07**

OR

Q.5 (a) (i). Discuss the concept of drive surface, check surface and part surface with reference to APT programming.   **03**

(ii). Plot geometry based on following geometry statements;   **04**

(a). L2 = LINE/ P1, PERPTO, L1

(b). P1 = POINT/ XSMALL, INTOF, C1, C2

(c). C1 = CIRCLE/ CENTER, P1, P2

(d). PAT1 = PATERN/ARC, C1, 20, CCLW, 6

(b) (i). Discuss preparatory functions G41, G42 and G40 with reference to cutter radius compensation in manual part programming.   **03**

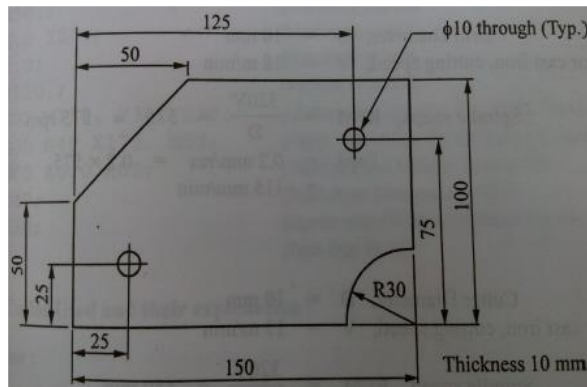(ii). Write manual part program for drilling of holes as shown in figure 3. Assume feed rate as 115 mm/min and spindle speed as 575 rpm.   **04**
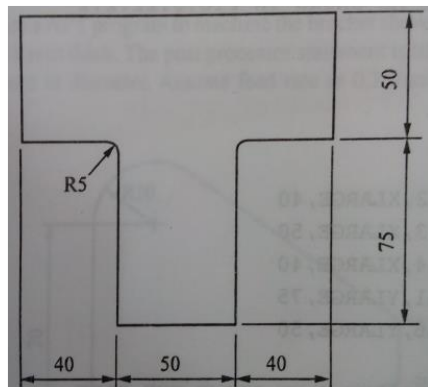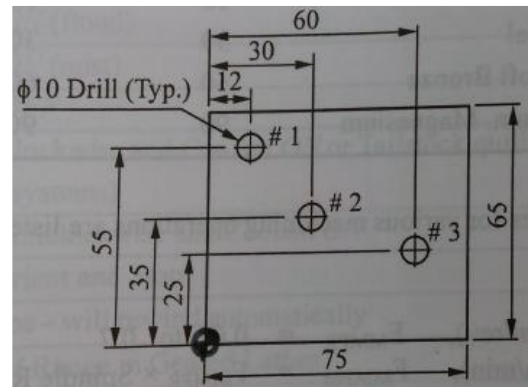

Figure 1

Figure 2

Figure 3

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