

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- VIIth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 171903****Date: 09/06/2012****Subject Name: Computer Integrated Manufacturing****Time: 02:30 pm – 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.

Q.1 (a) What are the objectives of CIM? Which major functional areas of the manufacturing enterprise considered for achieving CIM objectives? What are the benefits of CIM? **07**

(b) (i) Explain why recirculating ballscrews are used in NC/CNC machine tools. **03**

(ii) Explain the axes designation rules for machine tools employing rotating tools. Sketch a vertical machining center and designate its axes. **04**

Q.2 (a) Write a manual part program for turning a job shown in figure 1. The raw material is M.S. bar of size ϕ 90mm x 112 mm long. The sequence of operations to be performed and relevant machining parameters are given in the table below. **07**

Op. No.	Operation	Tool No.	Feed rate (mm/rev)	Speed
10	Facing	01	0.1	180 m/min
20	Rough turning (use canned cycle)	02	0.2	700 rpm
30	Finish turning	02	0.1	180 m/min

Show the part zero and state the canned cycle used for rough turning.

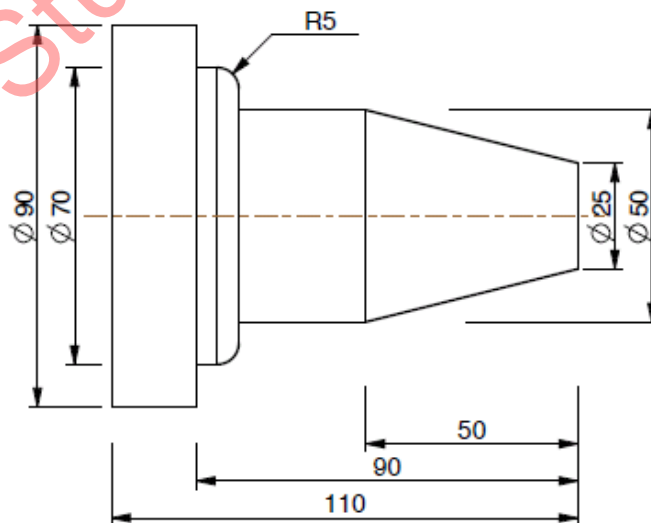


Figure 1

All dimensions are in mm

- (b) Write a manual part program for profile milling and hole drilling using a machining center. Show the part zero. 07

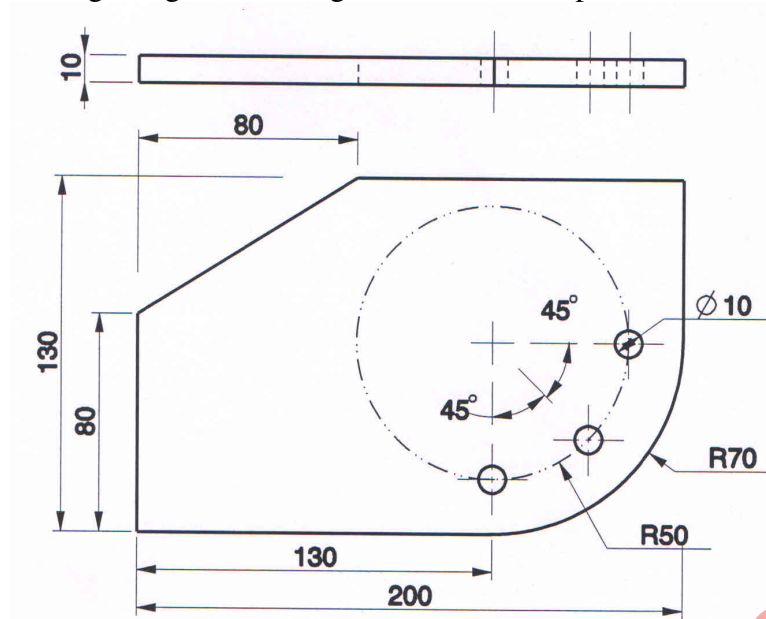


Figure 2

All dimensions are in mm

OR

- (b) Write an APT program for profile milling a component shown in figure 3. Thickness of part is 10 mm. Cutter diameter 15 mm and length 15 mm. 07

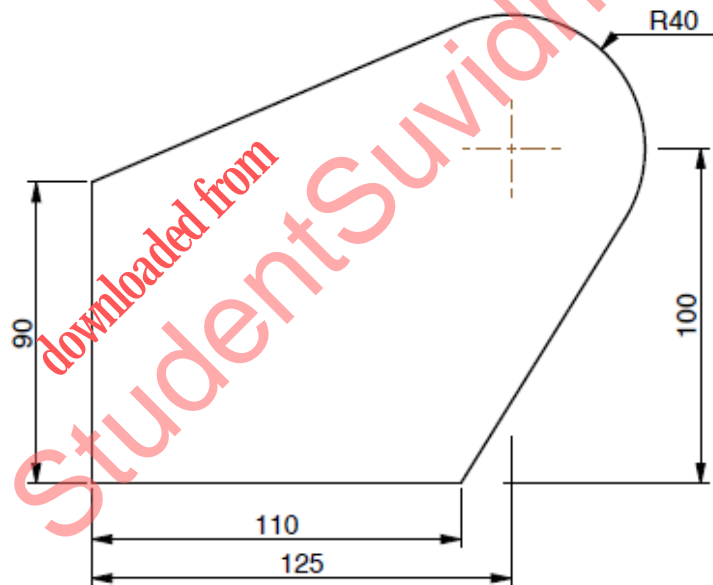


Figure 3

All dimensions are in mm

- Q.3** (a) What is Group Technology? What are the advantages of GT in manufacturing? 07
 (b) Explain the variant type CAPP system. State the benefits and limitations of variant type CAPP systems. 07

OR

- Q.3** (a) Explain following with reference to Group Technology: 07
 (i) Coding structures in GT (ii) Composite part
 (b) What are the major functions of process planning? What are the main problems associated with manual process planning? 07

- Q.4** (a) Enlist and explain different elements of a robot. **07**
 (b) Sketch and explain cylindrical and polar configurations of industrial robots showing work envelope. **07**

OR

- Q.4** (a) Explain on-line and off-line programming methods of robots. State advantages and disadvantages of each. **07**
 (b) Discuss the concept of CIM wheel and explain the importance of integrating the enterprise included therein. **07**

- 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. The Master production schedule specifies that 80 and 100 units of P are to be delivered in week 8 and 9 respectively. The lead times for each item is given below: **07**

Item	P	S1	S2	C1	C2	C3
Lead times in weeks	1	2	2	2	3	2
Units on hand					60	80

Prepare the MRP output for all items.

- (b) What is FMS? Explain the basic components of FMS. **07**

OR

- Q.5** (a) Explain the role of CMM in Computer Aided Quality Control. What are different elements of a CMM? **07**
 (b) What is an AGV? What are different types of AGVs? What are the benefits of using AGVs? **07**
