

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014****Subject Code: 172002****Date: 03-06-2014****Subject Name: Automated Manufacturing - I****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)** The following component is to be made using a CNC turning centre equipped with a FANUC OT controller. Write a complete manual part program for machining of the component shown in figure 1. Take Raw material of size $\Phi 105 \times 65$ mm. Limit maximum spindle speed to 3000 RPM. **07**

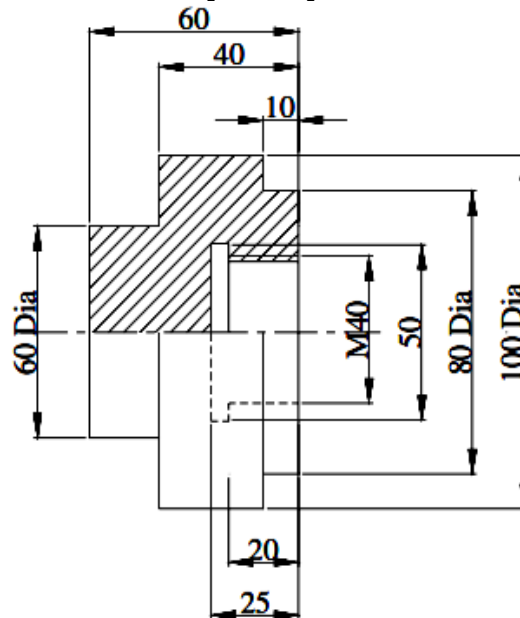


Figure 1. (All Dimension are in mm)

- (b)** Write a part program to machine the profile as shown in figure 2. Raw material size: $215 \times 125 \times 5$ mm. **07**

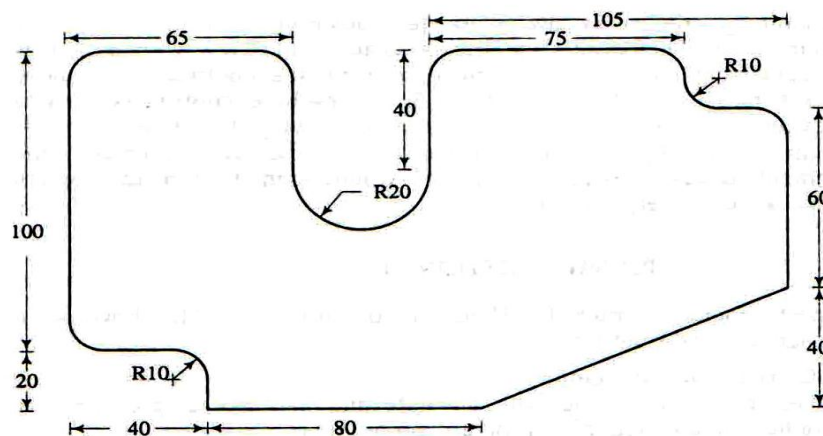


Figure 2. (All Dimension are in mm)

- Q.2 (a)** What is the purpose of using LM guides or plastic inserts in sideways? What are the advantages of Linear Motion guide ways? **07**
- (b)** What are the Reasons for implementation of automation in industries? **07**

OR

- (b) What are the difference between hard product variety and soft product variety ? 07

- Q.3 (a) Explain the structure of a program block and illuminate the difference between modal and nonmodal codes. 07
- (b) The following component is to be made using a CNC turning centre equipped with a FANUC OT controller. Write a complete manual part program for machining of the component shown in figure 3. Take Raw material of size $\Phi 22 \times 50$ mm. Limit maximum spindle speed to 2000 RPM. 07

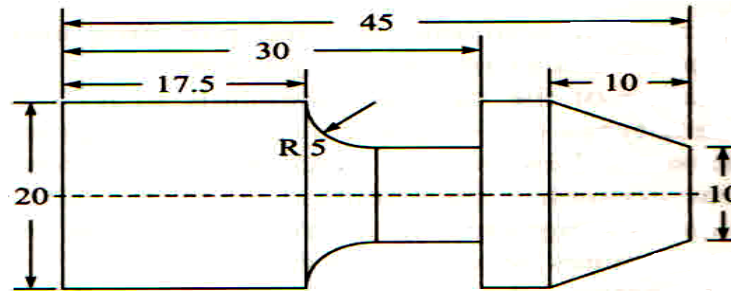


Figure 3.(All Dimention are in mm)

OR

- Q.3 (a) Explain the difference between the following cycles with respect to spindle rotation and tool movements. 07
- (i) G73 and G83
 - (ii) G74 and G84
 - (iii) Boring and back boring cycles
- (b) The height of storage aisle in an AS/RS= 80 ft and length of the L= 300 ft. suppose horizontal and vertical speeds of the S/R machine are 350 ft/min and 60 ft/min, respectively. The S/R machine requires 15 sec to accomplish a pick up –and –deposit operation. Find : (a) throughput for the aisle under assumptions that storage system utilization = 95% and a ratio of single-command to dual-command cycles of 3:1. 07

- Q.4 (a) Discuss the importance of process planning in product development. What is the need for computer aided process planning? What are its advantages? 07
- (b) What are the important features available in CMM software? Discuss major non-contact inspection methods. 07

OR

- Q.4 (a) Brifly Differentiate between rail-guided vehicles and automated guided vehicles. 07
- (b) What is the advantage of a vertical storage carousel over a horizontal carousel? 07

- Q.5 (a) Classification of rapid prototyping processes. Explain in brifly one of the RP process. 07
- (b) Discuss the two aspects of AGV in vehicle management: (1) Traffic Control and (2) Vehicle Dispatching. 07

OR

- Q.5 (a) Explain CMM applications and benefits. 07
- (b) Explain the application and advantage of integration of CAQC with CAD/CAM systems. 07
