Seat No.: _____ Enrolment No._____

# 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 centreequipped with a FANUC OT controller. Write a complete manual partprogram for machining of the component shown in figure1.Take Raw material of size Φ105 x 65 mm. Limitmaximum spindle speed to 3000 RPM. **07**

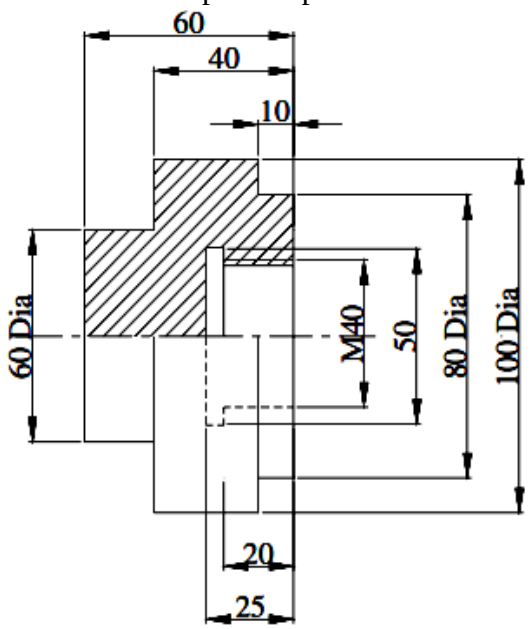


Figure 1. (All Dimention are in mm)

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

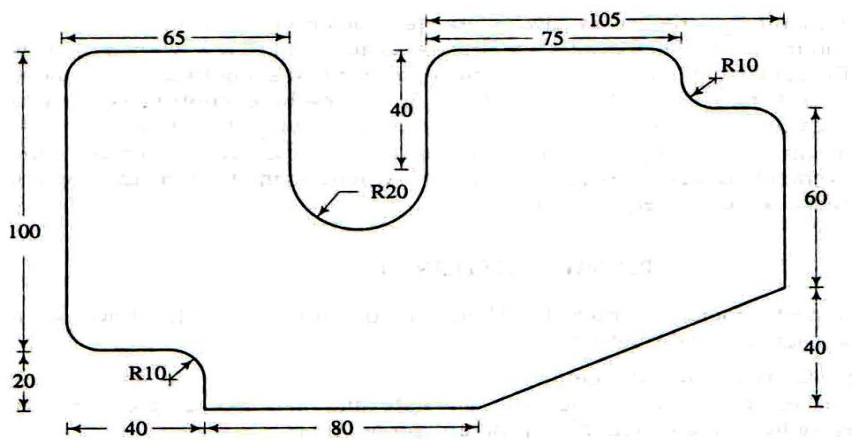


Figure 2. (All Dimention are in mm)

**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 Φ22 x 50 mm. Limit maximum spindle speed to 2000 RPM. **07**

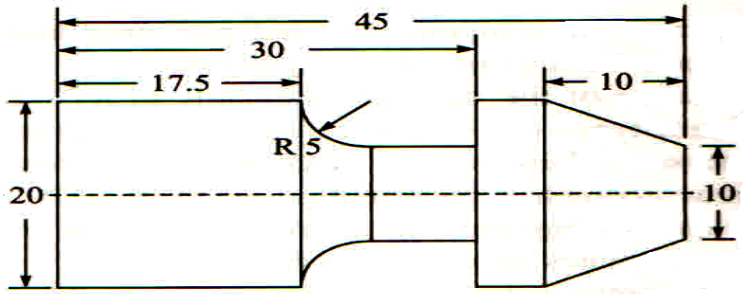


Figure 3.(All Dimention are in mm)

**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 ftand 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**

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