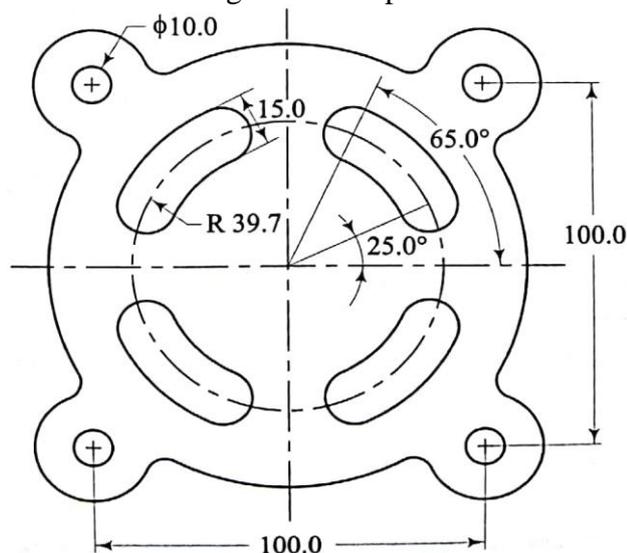


GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019****Subject Code: 2172002/2172010****Date: 26/11/2019****Subject Name: Automated Manufacturing - I****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

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

- Q.1** (a) What is programmable automation and what are some of its features? **03**
 (b) What is the difference between hard product variety and soft product variety ? **04**
 (c) The following component is to be made using a CNC machining Centre equipped with a FANUC controller. Write a complete manual part program for machining the holes and slots in the plate as shown in fig.1. assume plate thickness to be 10 mm. **07**



All Dimension are in mm

Fig 1.

- Q.2** (a) List ten strategies for automation and process improvement. **03**
 (b) Explain the meaning of numerical control. What are the areas where numerical control can be used? **04**
 (c) Discuss the salient features of point to point, straight line and contouring CNC systems. **07**

OR

- (c) Explain the use of following codes for CNC turning center: **07**
- (i) G00, G01, G02, G04
 - (ii) G71, G72, G73, G70
 - (iii) M02, M03, M05, M30
 - (iv) G92, G76, G32

- Q.3** (a) What do you understand by machine zero and work zero? Explain. **03**
 (b) What is the need of recirculation of rolling elements in LM guideways and ballscrews? **04**
 (c) What are the factors considered while designing the structure of a CNC machine? **07**

OR

- Q.3** (a) Explain Automatic Tool Changer(ATC) in CNC machine. **03**

- (b) Explain the difference between G71 rough turning cycle and G72 rough facing cycle in CNC turning machine. **04**
- (c) Using neat sketches, explain the working principle of incremental and absolute optical encoders. **07**
- Q.4** (a) What is CMM ? Explain. **03**
- (b) Difference between forward engineering and reverse engineering. **04**
- (c) What is forward sensing in AGVs Terminology? **07**
- OR**
- Q.4** (a) Name the various guidance methods available for automated guided vehicle(AGV). **03**
- (b) Explain different types of AGV. **04**
- (c) Difference between an AS/RS and Carousel storage system. **07**
- Q.5** (a) Explain the steps of RP techniques. **03**
- (b) Difference between rail-guided vehicles and automated guided vehicles. **04**
- (c) Explain carousel storage systems. Write down its application. **07**
- OR**
- Q.5** (a) Write down application of 3D printer. **03**
- (b) Classification of rapid prototyping processes. **04**
- (c) Types of AS/RS systems. Explain in details. **07**
