Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

VII SEMESTER B.TECH (MECHANICAL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: COMPUTER INTEGRATED MANUFACTURING [MME 405]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** the questions.
- Missing data may be suitable assumed.

1A. With neat sketch explain the coordinate systems used in milling, drilling and lathe machine. State the reasons for automating **03**

1B. Explain the features of CNC control system. What are the problems with conventional NC. **04**

1C. With neat sketch explain the working of linear bearings with balls and roller. **03**

2A. Explain the feed drives of CNC machines. List the advantages of recirculating ball screws **03**

2B. With neat sketch explain the working of planetary roller screw **02**

2C. Write a part program to perform the Rectangular Pocket Milling operation on a workpiece of dimensions 100mmX100mmX10mm.The pocket's dimension is 73mmX61mmX5mm and is located at the centre of the workpiece. Use a cutter diameter of 10mm. Length of the pocket is parallel to X axis. Take program zero at the top face center of the workpiece. Take a maximum depth of cut as 1mm for each pass. **05**

3A. Write a part program to obtain the component as shown in the Fig 3A. By using standard turning cycles only. **03**

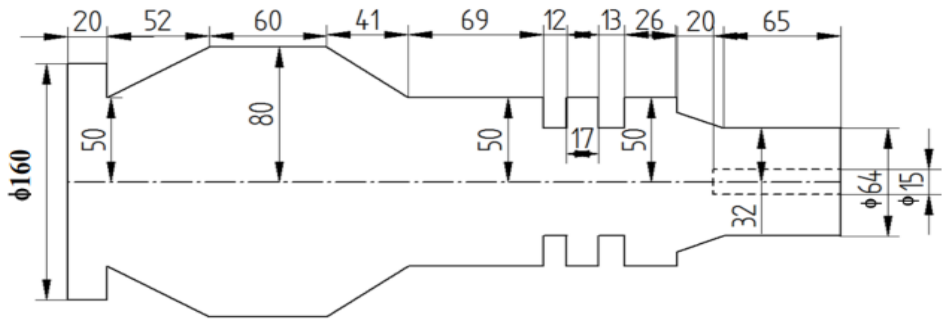

Fig. 3A

3B. Write a part program to obtain the component as shown in the Fig. 3B **03**

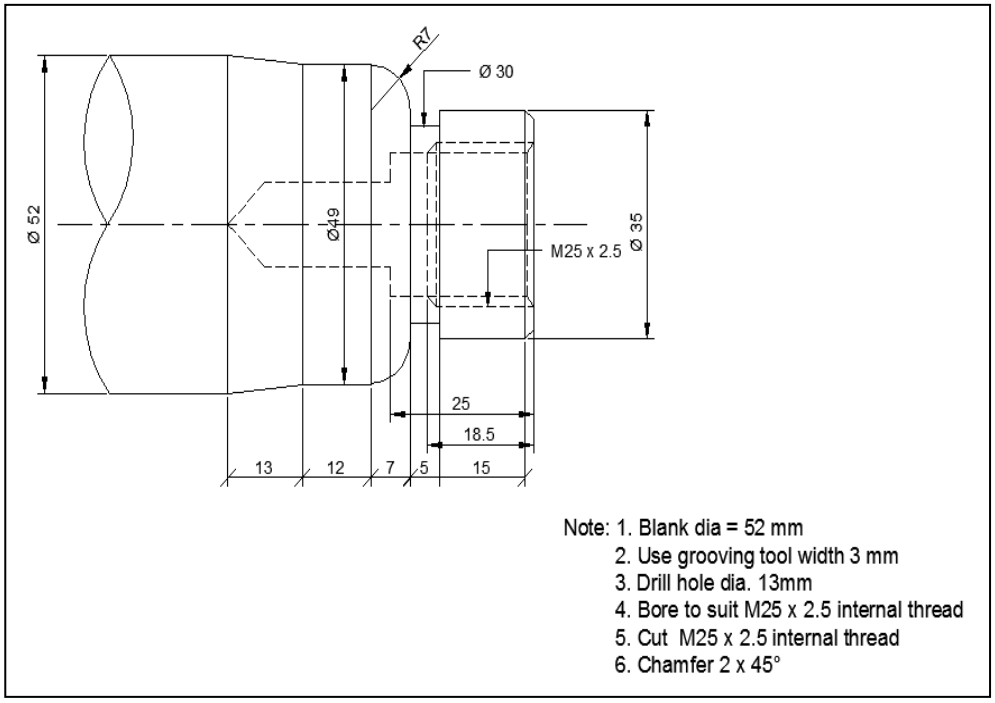

Fig 3B

3C. Write a part program to obtain the component as shown in the Fig. 3C **04**

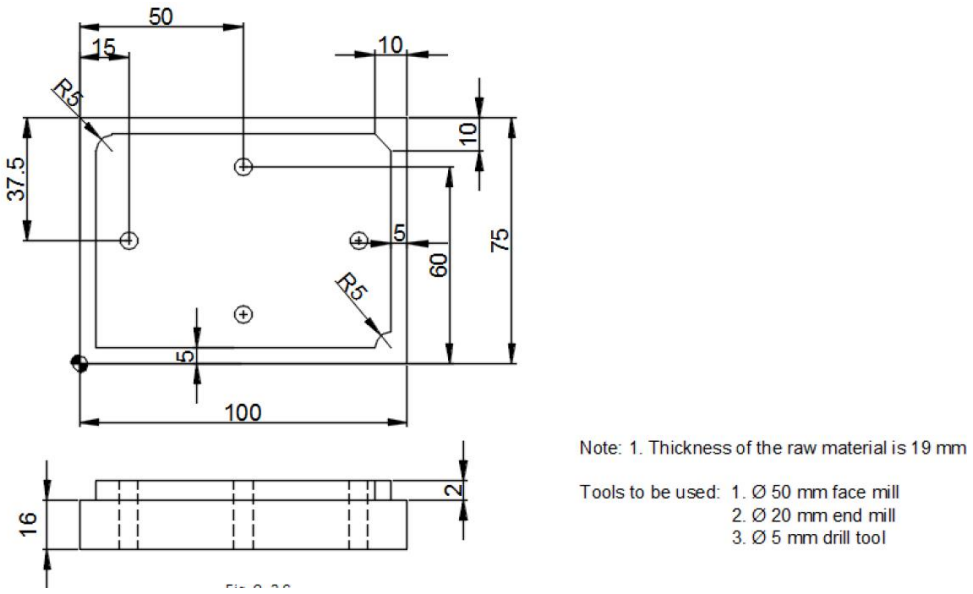

Fig 3C

4A. List and graphically represent Eulerian angle system I and Eulerian angle system II. **03**

4B. Explain the steps involved in production flow analysis. **04**

4C. Explain the working of an Automated Storage/Retrieval System. **03**

5A. Explain the principle of operation of AGV's with an example and mention the advantages of FMS. **03**

5B. Explain any 3 types of End-effectors used in industrial robots with proper applications. **03**

5C. The following data relate to a mechanical gripper using friction to grasp an object: **04**

Weight of the part = 30 N, Coefficient of friction = 0.45, Length l_1 = 75 mm, l_2 = 55, l_3 = 22 mm, l_4 = 48 mm, Diameter of the piston of the pneumatic cylinder = 79 mm, FOS = 1.3, If the gripper is decelerating with 9.81 m/s^2, Calculate: i) The gripping force, ii) Actuation force required to obtain this gripping force. iii) The pressure needed to operate the piston, iv) The power required if the discharge is 0.015 m^3/s.

6A. Differentiate between process type layout and group technology layout. List the advantages of group technology layout. **03**

6B. Explain the inputs provided to MRP system. **03**

6C. Explain two types of routing systems used in AGV's. **04**