Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (MECHANICAL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: COMPUTER INTEGRATED MANUFACTURING [MME 405]

REVISED CREDIT SYSTEM
(02/12/2016)

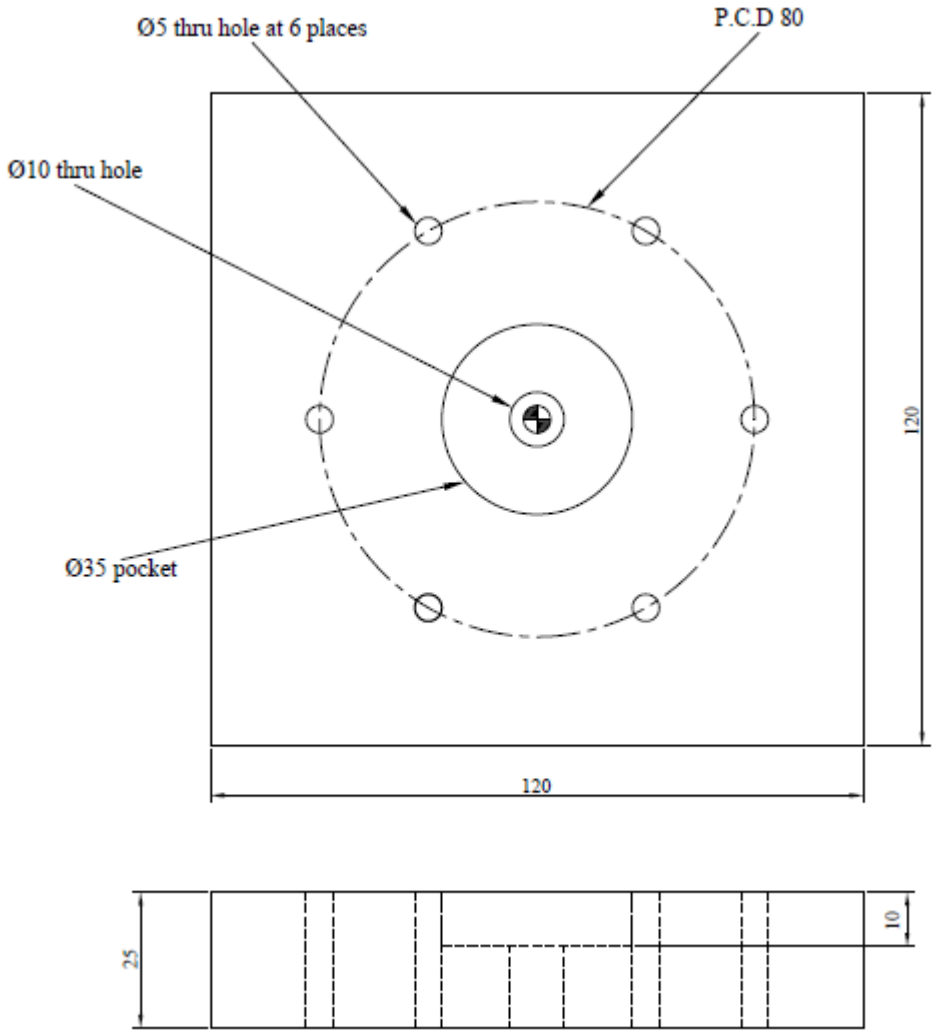
Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

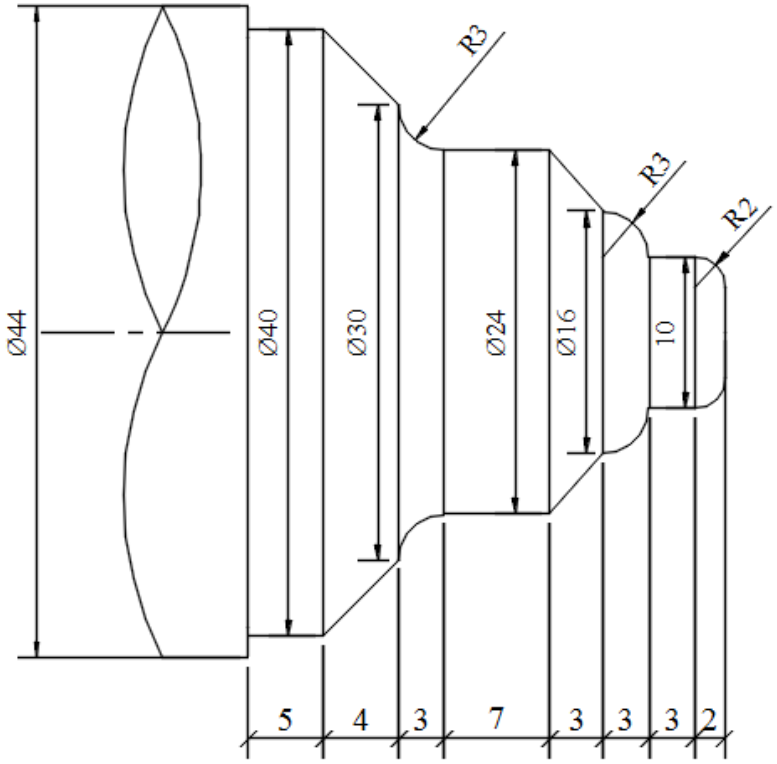
1A.	For a tungsten carbide insert for turning, decode the following: CNMG-12-04-08	**2**
1B.	Explain the problems associated with conventional NC machines.	**3**
1C.	Write a CNC part program for the workpiece shown in Fig. Q 1C. Use ϕ12 mm slot mill cutter for pocketing operation.	**5**
2A.	Write a CNC part program for the workpiece shown in Fig. Q 2A. Assume a uniform machining allowance of 3 mm on the casting.	**2**
2B.	Write a CNC part program for the workpiece shown in Fig. Q 2B. Use grooving tool of width 3mm.	**3**
2C.	What are adaptive control machining systems? Explain the two types of it.	**5**
3A.	Discuss the programming / operating and diagnostic features of CNC machines.	**2**
3B.	Explain with sketches, means to replace sliding friction with rolling friction in guideways of CNC machine tools.	**3**
3C.	Write a CNC part program for the workpiece shown in Fig. Q3C.	**5**
4A.	Derive the expression for gripper force and determine the weight of the object grasped by the mechanical gripper for the following data. Gripper force exerted on the object is 125N. The coefficient of friction between the part and the gripper pad is 0.3. The gripper is accelerating with an acceleration of 9.81m/s^2. Assume a factor of safety 1.5.	**3**

4B.	With flow chart explain Opitz part classification and coding system.	**3**
4C.	Explain with block diagram the MRP system.	**4**
5A.	Explain various phases of Shop Floor Control.	**3**
5B.	Explain briefly classifications of AS/RS.	**3**
5C.	With neat sketches explain the basic configurations of an industrial robot.	**4**
6A.	With reference to industrial robotics explain the following.	**3**
	i) Compliance and stability	
	ii) Spatial Resolution and Control Resolution	
6B.	Explain with flow chart retrieval type CAPP system.	**3**
6C.	Define FMS. With neat sketch explain the types of FMS layouts.	**4**



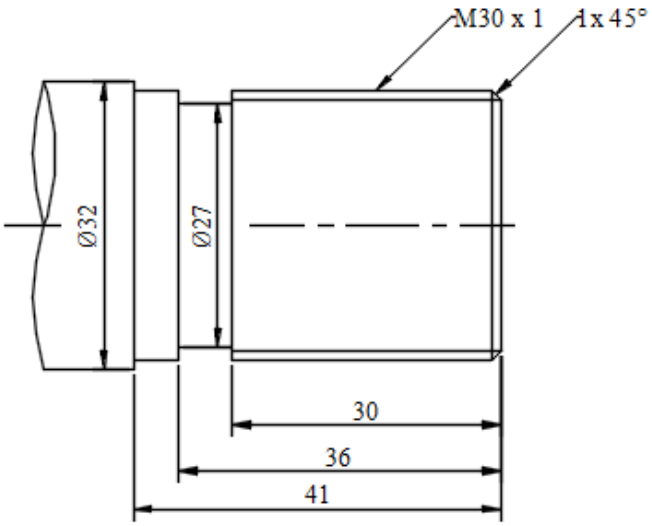
Note: Use ϕ12 mm slot mill cutter for pocketing operation

Fig. Q 1C



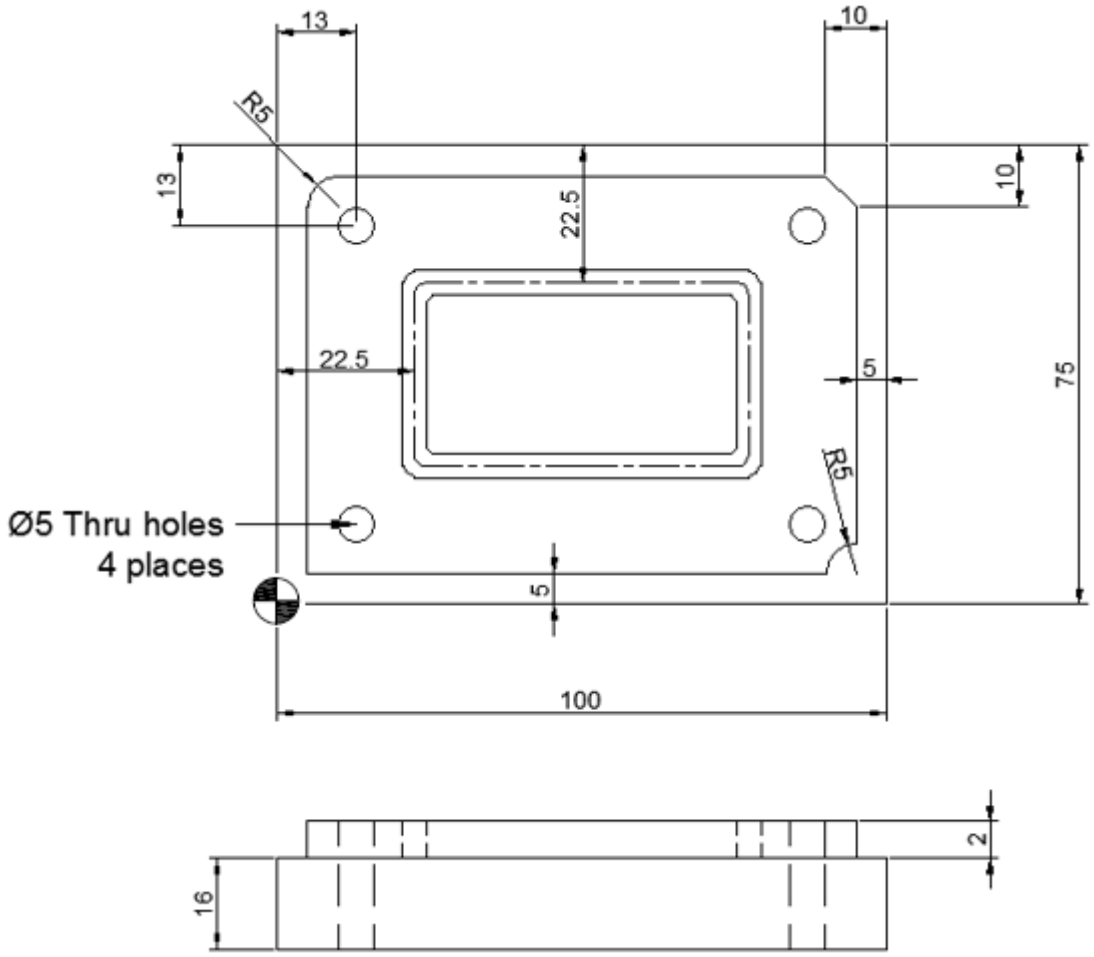
Note: Assume a uniform machining allowance of 3mm on the casting

Fig. Q 2A



Note: Use grooving tool of width 3mm

Fig. Q 2B



Note: 1. Face mill to remove 1 mm thick on top. Use Ø 50 shell end mill
2. Contour mill the sides and corners using Ø 20 slot mill
3. Mill rectangular slot using Ø 4mm slot mill
4. Drill 4 holes using Ø 5mm drill

Fig. Q 3C