Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: COMPUTER INTEGRATED MANUFACTURING [AAE 453]

REVISED CREDIT SYSTEM
(02/12/2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Draw Sketch's using PENCIL only.

1A.	List the steps involved in the program planning.	**(03)**
1B.	Discuss automated storage and retrieval systems.	**(03)**
1C.	Classify the CNC machine tools based on machining centers & explain any two.	**(04)**
2A.	Explain the axial grooving instruction format with a sample program.	**(03)**
2B.	Contrast the differences between Uni-polar and Bi-polar Stepper motors.	**(03)**
2C.	Discuss the different components related to the CNC machine tools.	**(04)**
3A.	Sketch and explain linear and rotary type of encoders used in CNC machines.	**(05)**
3B.	Explain the benefits of using cellular manufacturing.	**(02)**
3C.	Write CNC program for figure 1 using G70 Bolt Hole Circle G-code to drill 8 holes evenly spaced in a circle.	**(03)**
4A.	Sketch and explain the working principle of SCARA robot with its application.	**(03)**
4B.	Sketch and explain the following mechanical end effector configurations i. Rack and Gear type of actuation ii. cam type of Actuation	**(04)**
4C.	Explain the different types of sensors used in robots.	**(03)**
5A.	Define tool vector input & share its benefits.	**(02)**
5B.	Discuss different types of probes used in CMM.	**(03)**

5C. Define Group technology. Explain ways and means to identify part families. **(05)**
Explain how parts classification and coding is done in group technology?

6A. Write a part program for the figure.2 shown below considering cut per pass as 0.5mm. **(04)**

6B. Solve table 1 using rank order clustering algorithm. **(04)**

6C. List the components of the machine vision system. **(02)**

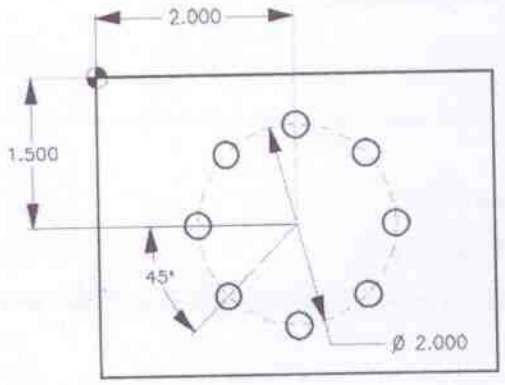

Fig 1 (consider hole size as 0.1" & depth as 0.5")

Machines	1	2	3	4	5	6	7	8	9	10
M1	1	1	1	1	1		1	1	1	1
M2		1	1	1					1	1
M3	1				1	1	1			
M4		1	1	1				1	1	1
M5	1	1	1	1	1	1	1	1		

Table.1

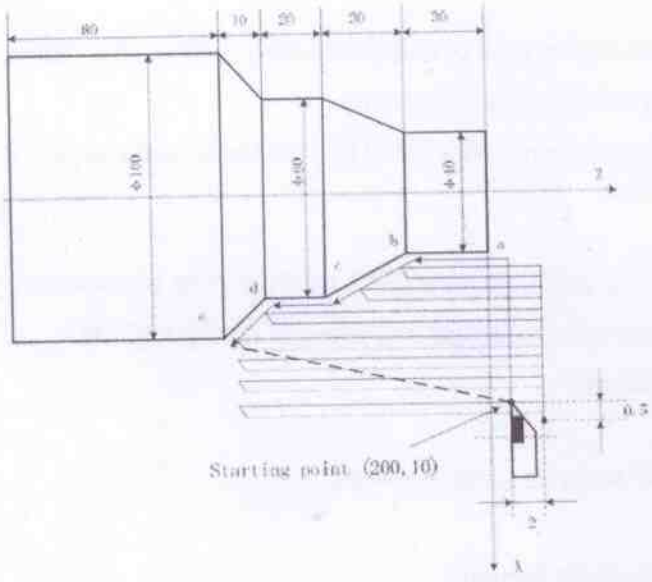

Fig 2