**M. PRODUCTION ENGINEERING 1ST SEMESTER EXAMINATION, 2017**

SUBJECT : **COMPUTER INTEGRATED MANUFACTURING**

**Time : Three hours** **Full Marks : 100**

**Answer five questions taking at least three from group-A**

**GROUP - A**

1 a) Show the major components of a CNC machine tool, indicating the locations of actuators and internal sensors for the various movements of tool and job and the electrical interface between them & the various components of the CNC m/c controller. 5+5

b) State the basic differences between CNC m/c tools and conventional m/c tools. State the type of production and the type of automation where use of CNC machines are economically justified. 7+3

2 a) Discuss the differences between point-to-point, straight line (paraxial) and continuous path (contouring) control in the context of CNC machine tool. 10

b) Explain the need for position/displacement sensors for closed loop control of slide movement of CNC m/c tools 10

3 a) With neat sketches show the axis system in CNC lathe and CNC milling machine. 8

b) Write a manual part program for turning a job for the finishing cycle as shown in fig. 1 in a CNC lathe. 12

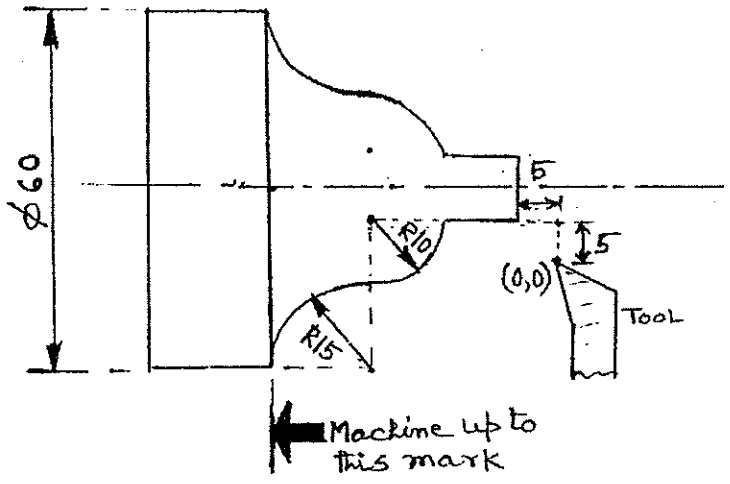


**FIG. 1**

4 a) Explain the working principle of any sensor for providing feedback for angular position of the axis leadscrew. 8

b) Write a manual part program to machine a circular slot as shown in fig. 2 in a CNC milling machine using an end-milling cutter. 12

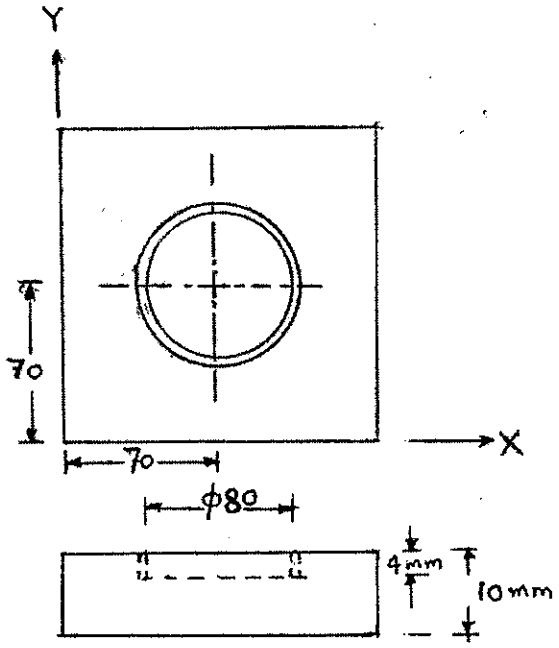


**FIG. 2**

5 a) Using a sketch show drive surface, check surface and part surface in cnc machining. 4

b) Write down the basic difference between APT Processor and Post Processor 4

c) Write an APT program for drilling holes (depth 5 mm) in a job shown in fig. 3 using a CNC driilling machine. 12

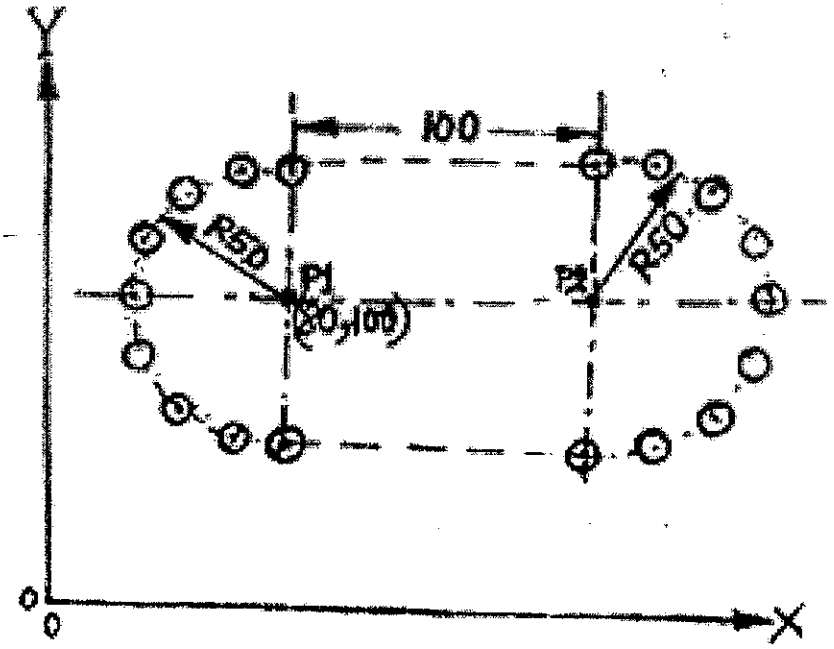


**Fig 3**

6 a) Compare manual part programming and computer aided part programming. Show the steps followed in computer aided part programming. 4+4

b) Write a program in APT language for milling the edges of a job shown in fig. 4 using an End Mill cutter in a CNC milling machine 12

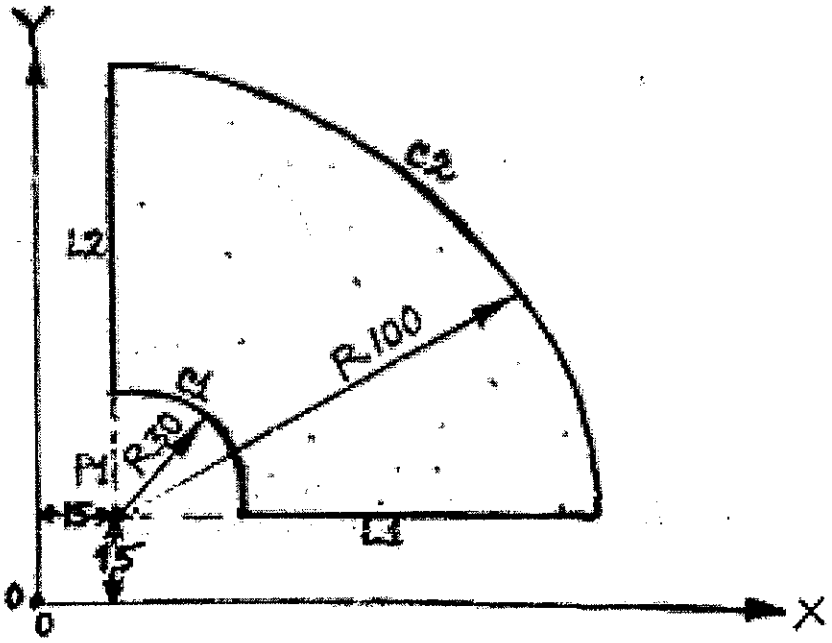


**Fig 4**

## GROUP - B

| | | |
|---|---|---|
| 7. | What are the physical activities and information processing activities in CIM? Show the relationship between physical activities and information processing activities with a suitable model. | 20 |
| 8 a) | What is Material Requirement Planning (MRP)? Why is aid of computer necessary for MRP? Write down the benefits of MRP. | 3+3+4 |
| b) | Write down the objectives of Computer Aided Quality Control (CAQC)? What is Computer Aided Inspection? Discuss about some computer aided non-contact type inspection methods. | 4+2+4 |
| 9 a) | What are the demerits of traditional Process Planning System? Explain the needs for Automated Process Planning and the use of Computer for this purpose. Write down the benefits of Computer Aided Process Planning (CAPP). | 2+4+4 |
| b) | What are the different types of Computer Aided Process Planning (CAPP) methods? Explain any one of them | 2+8 |
| 10 a) | What is Group Technology? What are the benefits achieved by implementing Group Technology? Explain the needs for parts classification and coding in Group Technology | 2+4+4 |
| b) | Describe Computerized Machinability Data System implemented in CAPP, and explain how it helps in solving the problem of selecting proper cutting speed and feed. What are the two different types of Computerized Machinability Data System? | 8+2 |