M.E. PRODUCTION 1st YEAR1stSEMESTER EXAMINATION, 2018

COMPUTER INTEGRATED MANUFACTURING

Time: Three hours   Full Marks: 100

Answer ten questions taking at least eight from group-A

GROUP - A

1. Show the major components of a CNC lathe or milling machineindicating the locations of actuators and internal sensors for the various joints and the electrical interface between them & the various components of the CNCmachine controller.   10

2. State the basic differences between CNC machine tools and conventional Automatic machine tools. Why is the use of CNC machine tools and robots justified in batch production where there are changes of products in batches and wide variety of products?   10

3. Discuss the differences between point-to-point, paraxial and continuous path (contouring) control in the context of CNC machine tool with examples.   10

4. With neat sketches show the axis system in CNC lathe and CNC milling machine. Also discuss on the generalized axis system in CNC Machine Tools.   5+5

5. What are the basic differences between manual part programming and computer aided part programming for CNC m/c tools? Show the steps followed in computer aided part programming.   5+5

6. What do you mean by drive surface, part surface and check surface in CNC part programming?What are the basic differences between Post Processor and APT Processor?   5+5

7. Explain the need for position/displacement sensors for control of slide movement of CNC m/c tools and also velocity sensors for spindle velocity control.   5+5

8. Explain the working principle of any type of sensors for providing feedback for angular position of the axis lead screw and angular velocity of the spindle.   5+5

9. Write a manual part program for the finishing cycle of turning of a job as shown in fig. 1 to be machined in a CNC lathe. (STPT indicates start point, all dimensions are in mm)   10
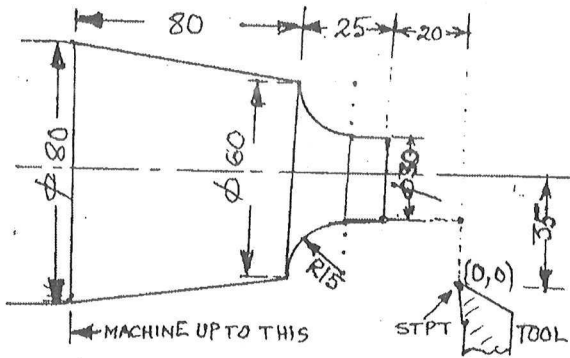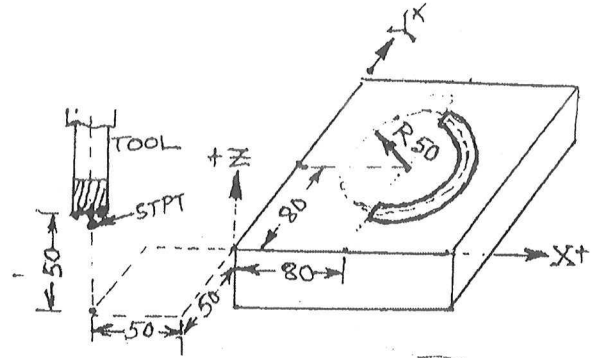

Fig. 1

Fig. 2

10. Write a manual part program to machine a semicircular slot as shown in fig. 2 in a CNC milling machine using an end mill cutter.   10

11. Write an APT program for drilling holes (depth 5 mm) in a job shown in fig.3 using a CNC drilling machine.   10
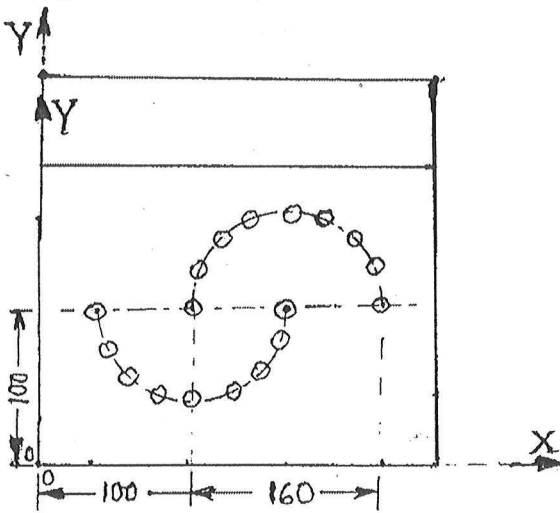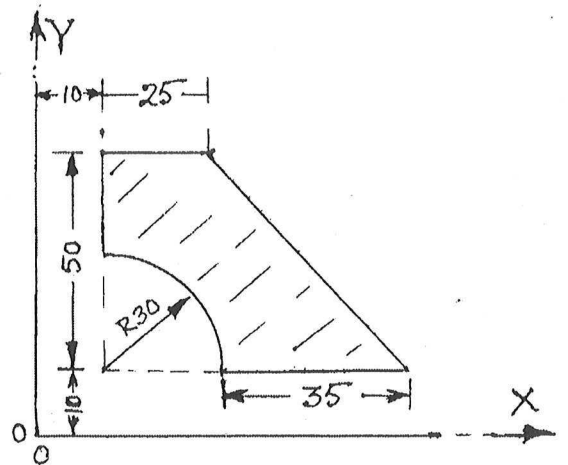

Fig. 3

Fig. 4

12. Write a program in APT language for milling the edges of a job shown in fig. 4 using a CNC milling machine using an end mill cutter.   10

GROUP - B

13. Discuss about the physical activities and information processing activities in CIM. Show the relationship with a model. What are the hardware and software elements required for CIM?　　10

14. Describe Computerized Machine ability 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

15. Why is aid of computer necessary for MRP in a CIM environment? Explain the needs for Automated Process Planning and the use of Computer for this purpose.　　5+5

6. 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

7. What are the different types of Computer Aided Process Planning (CAPP) methods? Explain any one of them　　2+8