Printed Pages : 4 TME702

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0401 Roll No.

B.Tech

(SEM VII) ODD SEMESTER THEORY EXAMINATION 2009-10

COMUTER AIDED MANUFACTURING

Time : 3 Hours] *[Total Marks : 100*

Note : *(1) All questions carry equal marks.*

(2) Attempt all questions.

1 Attempt any **four** parts : 5×4=20

(a) What is automation ? Discuss the importance and need of automation in Indian industry.

(b) Explain the function of MCU in NC machine tools. What is the role of PLC in CNC system ?

(c) What are the problems that are associated with conventional NC ? How can it be overcome in CNC ?

(d) Discuss the various types of NC motion control system with the help of suitable diagrams.

(e) Discuss the factors by which productivity of NC machines can be increased.

2 Attempt any **two** parts : **10×2=20**

(a) (i) What are the names for the three surfaces that the cutter moves, in a start up statement ? Is it important that these surfaces be listed in any kind of order in the start up statement ? What happens if they are not ?

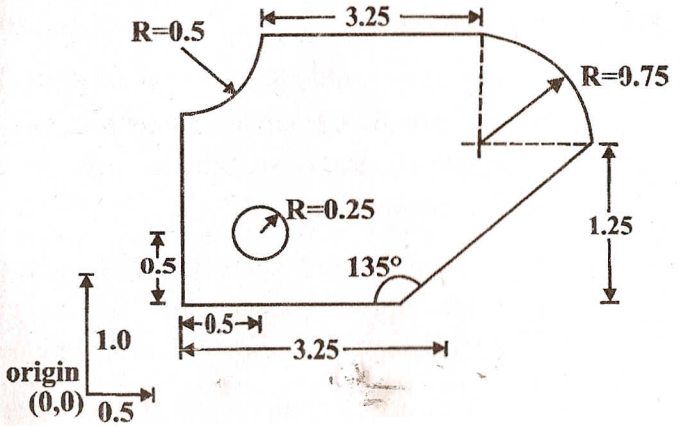
(ii) Differentiate clearly between fixed cycles / canned cycles and subroutines / subprogram. Explain how canned cycles can reduce the programming efforts.

(b) (i) Explain the logical block of information in a CNC part program. Which of the modes, constant RPM or constant cutting speed do you use for the machining of tapered surfaces ? Explain the effects of the two modes on the surface finish.

(ii) Explain clearly the role of computer in computer assisted past programming.

(c) Write the APT geometry statements necessary to fully define the component illustrated in Fig. 1 below. Attempt to keep the number of statements to a minimum. Also write motion statements. Generate any additional check lines if necessary. Start from the origin and proceed

anticlockwise around the workpiece. Also sketch the path of the tool. All dimensions are in inches.



3 Attempt any **four** parts : **5×4=20**

(a) Describe the automatic speed control of DC motor with closed loop feedback with tacheometer and develop the formula for angular speed.

(b) Differentiate between an open loop and closed loop control system. Explain the working of an NC machine having provision for velocity and positioning feedback.

(c) What is the difference between a CNC and DNC system ? Explain the two alternative system configuration by which the communication link is established between the control computer and the machine tool in DNC.

(d) Explain with the help of diagram/table, the principle of working of a circular interpolator.

(e) Under what conditions an adaptive control is recommended ? Distinguish between ACC and ACO types of adaptive control.

4 Attempt any **two** parts : **10×2=20**

(a) What are the problems associated with a traditional process planning system ? How these problems are overcome in automated process planning system ?

(b) Briefly explain the guidelines for implementing group technology. Explain the advantage achieved by group-technology and its limitations.

(c) What are the various components of a computer integrated manufacturing systems (CIMS) ? Explain the key functions of CIMS.

5 Attempt any **two** parts : **10×2=20**

(a) Explain the term "Artificial intelligence". How is it used in an intelligent manufacturing system ?

(b) What are the various methods for robot programming ? Explain the features of VAL or AML robot programming.

(c) Differentiate clearly between a CNC machine and robot. Discuss the various types and generations of robots with applications.