

2074

B. E. (Mechanical Engineering)
Fifth Semester

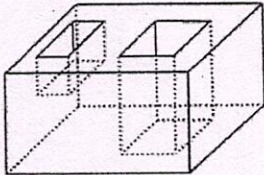
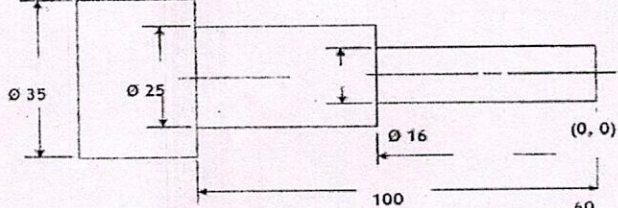
MEC-502: Computer Aided Design and Manufacturing (CAD/CAM)

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

1	a) How CIM is different from CAD & CAM. b) What is meant by a Geometric Entity? Give few examples. c) Write the parametric equation of a Bezier surface. d) Write two NC words and their functions for coolant operation in part programming. e) What is the significance of drive surface in APT.	(5 x 2)
Part A		
2	a. What are the reasons for implementing a computer aided design system? With the help of a block diagram, explain the computer aided design process. b. What is hard automation? What are the advantages and risks associated with this type of automation?	7 3
3	a. Locate the new position of the triangle [A (3, 4), B (6, 3), C (6, 8)] after its rotation by 90° clockwise about the centroid and then reflection about a line parallel to y axis and passing to centroid. Use homogeneous transformation and plot initial intermediate and final position of the triangle. b. Describe 2d shear transformation about y axis by taking suitable example.	7 3
4	a) What do you mean by blending functions? Describe with examples. b) Explain how a cubic curve is defined. Differentiate between Bezier and B- spline curves with reference to number of control points, degree of curve and local/global control. c) The coordinates of the four control points relative to a current WCS are given by $P_0 = [2 \ 2 \ 0]^T$, $P_1 = [2 \ 3 \ 0]^T$, $P_2 = [3 \ 3 \ 0]^T$, $P_3 = [3 \ 2 \ 0]^T$. Find the equations of the resulting Bezier curve.	3 3 4
Part B		
5	a) What is DNC system? Explain its types with the help of suitable diagram. b) Describe open loop CNC system vs close loop system c) Explain the function of ATC.	4 3 3
6	a) Take any two solid objects and with the help of neat diagrams, explain various Boolean operations. b) Develop the csg data table for the object as shown in the Fig 1.	4 6
7	a) Write a CNC turning programming for the component as shown in the Fig 2. Suitable assumption can be taken and mentioned also. b) What are subroutines? Describe with suitable example	7 3
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Fig 1 :</p> </div> <div style="text-align: center;"> <p>01 (All dimensions are in mm).</p>  <p>Fig 2:</p> </div> </div>		

x-x-x