Exam.Code:0941
Sub. Code: 6722

2122

B. E. (Mechanical Engineering)

Fifth Semester

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

Time allowed: 3 Hours | Max. Marks: 50

***NOTE**: Attempt <u>five</u> questions in all, including Question No. 1 (Section-I) which is compulsory and selecting two questions each from Section B- C.*

x-x-x

Section A

1. i. Describe tool length compensation? Write its code also. 5x2
   ii. Differentiate explicit vs. implicit equations.
   iii. Write the equation of Bezier curve having 3 control points.
   iv. What is the difference between 2.5 d and 3d Cad Model?
   v. Differentiate between rapid and feed mode and mention corresponding G codes.

Section B

2. i. What is shear transformation? Explain 2d shear transformations by taking suitable examples and neat sketches. 5

   ii. An object with vertices A (2, 2), B (4, 4), C (6, 2) and D (4, 6) is rotated about A by 90° counterclockwise direction followed by reflection about y=x line. Find and plot the initial and final position of the object. 5

3. i. Find the midpoint of a hermite cubic curve with two end points as (1, 1) and (6, 5) and corresponding tangent vectors as (0,4) and (4, 0). 7

   ii. What is parametric representation of curves? Why it is more used compared to non parametric representation. 3

4. i. What are knot values in B-Spline curve and how they affect the curve shape? How continuity, knot values and segments of B-spline curves are determined. Explain. 5

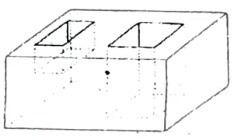
   ii. What is geometrical modeling? Differentiate between Solid Modeling and Wire Frame Modeling 5

Section C

5. i. How CNC machines can be classified based on motion control systems. Describe with suitable examples. 5

   ii. Describe parametric representation of surfaces? Discuss the representation of ruled surface. 5

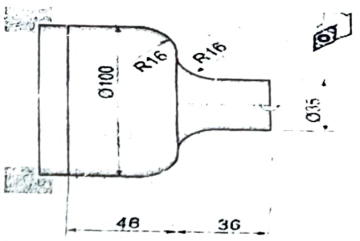
6. i. What is the importance of Euler's Formula in b-rep? Find the number of edges for the solid as shown in the diagram using Euler's Formula 5



   ii. What is APT part programming. Briefly explain the concept of drive surface and check surface in APT with example. 5

P.T.O.

7. i. Write a part program for turning the component on CNC lathe as shown in diagram. Write suitable assumptions also. 7



ii. What is adaptive control. Discuss the significance of adaptive control in CNC machines. 3

x-x-x