B.E. (Mechanical), 5th Semester

Computer Aided Design and Manufacturing, MEC-502 , 1st Sessional (2022)

Time allowed: 1.5 hours | Max. Marks: 30

Note: All questions are compulsory.

1	a)	The coordinates of four control points relative to a current WCS are given by $P_0(5, 5)$, $P_1(5, 6)$, $P_2(6, 6)$, $P_3(6, 5)$. Find the equation of the resulting Bezier curve. Also find points on curve for u = 0, 0.25, 0.35 0.5, 0.65, 0.75, 1. Plot the curve and display control points also. Find slope of the Bezier curve at the mid of the curve.	(8)
	b)	A 2 degree B-Spline curve has 6 control points. Find the continuity and no. of segments of the curve.	(2)
2	c)	An object with vertices A (1, 1), B (3, 3), C (5, 1) and D (3, 5) is rotated about A by 90° counterclockwise direction followed by reflection about x=y line. Find and plot the intermediate and final position of the object. Use Homogeneous transformations.	(7)
	d)	What is the difference between 2d, 2.5d and 3d models? Write the advantages and disadvantages of wireframe modeling.	(3)
3	a)	Why parametric equations are required. Describe parametric and nonparametric equations of line, circle and ellipse.	(4)
	b)	Explain 2d homogeneous shear transformations by taking suitable example.	(3)
	c)	Describe and two examples of fixed automation. What are the advantage and disadvantages of fixed automation?	(3)