

(A)

[M19CAD1101]

I M. Tech I Semester (R19) Regular Examinations

GEOMETRIC MODELING

Department of Mechanical Engineering

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

 Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
		UNIT-I			
1.	a).	Explain abt Non – Parametric representation of curves.	1	2	8
	b).	Derive the geometric form of hermit's cubic spline.	1	3	7
		OR			
2.	a).	Supply the algebraic form of a cubic spline.	1	2	8
	b).	What are the properties of parametric curves?	1	2	7
		UNIT-II			
3.	a).	Explain about the properties of Beizer curve.	2	2	8
	b).	Derive the equation of a closed Bezier curve of degree 5.	2	3	7
		OR			
4.	a).	Explain about composite beizer curves	2	2	8
	b).	Explain about truncated and subdividing of curves	2	2	7
		UNIT-III			
5.	a).	Calculate the five third-order non-uniform B-spline basis functions $N_{i,3}(t)$ $i=1,2,3,4,5$ using the knot vectors $[X]=[0011333]$ which contains an interior repeated knot value.	3	3	8
	b).	Explain abt Quadratic and cubic B –Spline basis functions	3	2	7
		OR			
6.	a).	Fit a B-spline curve with the following control points $P_1(0,0)$, $P_2(2,2)$, $P_3(4,4)$, $P_4(6,6)$.	3	3	8
	b).	Sweep the normalized cubic spline curve segment defined by $P [0 \ 3 \ 0 \ 1]$, $P [3 \ 0 \ 0 \ 1]$ and $P_i [3 \ 0 \ 0 \ 0]$, $P_i [3 \ 0 \ 0 \ 0]$ 10 units along Z-axis.	3	3	7
		UNIT-IV			
7.	a).	Determine the point on bilinear surface defined by $P(0,0)=[0 \ 0 \ 1]$, $P(0,1)=[1 \ 1 \ 1]$, $P(1,0)=[1 \ 0 \ 0]$, $P(1,1)=[0 \ 1 \ 0]$, i.e., the ends of opposite diagonals on opposite faces of unit cube in object space, corresponding to $u=w=0.5$ in parametric space.	4	3	8
	b).	Show by example that a planar coons bi-cubic surface results when the position, tangent and twist vectors all lie in the same plane.	4	3	7
		OR			
8.	a).	Develop the equations of following surfaces: (i) Torus; (ii) Ruled surface; (iii) coons bilinear patch; & (iv) Bezier	4	3	8

		surface of degrees 2×3 .			
	b).	surface.	4	2	7
		UNIT-V			
9.	a).	Discuss the properties of composite objects.	5	2	8
	b).	Explain abt Tri -cubic solid in detail.	5	2	7
		OR			
10.	a).	Explain Half space modeling in detail and provide two examples.	5	2	8
	b).	Discuss with the help of neat sketches, the most commonly used solid entities	5	2	7

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M-MARKS

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