PVP 12

Code: **MEMD2T5A**

I M.Tech - II Semester - Regular Examinations – September 2015

GEOMETRIC MODELING
(MACHINE DESIGN)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. Explain 3D Shearing Transformation and derive matrix for shear transformation. 14 M

2. Listout the drawbacks of Cubic spline and find the equation of Hermite Cubic Spline which defined by end points $P_0(0,0)$, $P_1(3,0)$ with tangent vectors $P'_0(1,1)$ and $P'_1(1,1)$. Also calculate intermediate points at u=1/2 and u=2/3. 14 M

3. A cubic Bezier curve is defined by the control points as $P_0(1,1)$, $P_1(2,3)$, $P_2(4,3)$ and $P_3(5,1)$. Find the equation of curve and its mid point. Also list the drawbacks of the Bezier curve. 14 M

4. The coordinates of 4 control points are given by $P_0(1,1)$, $P_1(2,3)$, $P_2(4,3)$ and $P_3(5,1)$. Find the equation of B-spline curve and its mid point. 14 M

5. Explain how surfaces can be described mathematically in 3D space by parametric or non parametric equations. 14 M

6. Compare the splines for the same control points (0,0), (4,3), (2,4) and (12,0) created by B-spline and Bezier spline techniques. 14 M

7. Explain in detail the following solid modeling methods
   a) Boundary representation and
   b) Half space modeling.

   14 M

8. Derive the Geometric form of a Tri-cubic solid. 14 M