

**I M.Tech - I Semester – Regular / Supplementary Examinations  
December 2018**

**GEOMETRIC MODELLING  
(MACHINE DESIGN)**

Duration: 3 hours

Max. Marks: 60

Answer the following questions.

1. a) Explain importance of 2D and 3D transformations in any CAD system? 7 M  
b) Find the transformed coordinates when a line [(3,4), (4,2)] is rotated about a z-axis by an angle of  $45^{\circ}$  in anticlockwise direction. 8 M

(OR)

2. a) Explain the various graphic transformations required for manipulating the geometric information? 7 M  
b) What is the need for concatenation of transformations? 8 M
3. a) Explain the various curve manipulation functions in detail. 6 M  
b) If three control points of the quadratic Bezier curve are known, how do you calculate algebraically the equation of that curve. 9 M

(OR)

4. What is 'knot' values in B-Spline curves and how they affect the curve shape? And also explain how these are determined? 15 M
5. a) Describe the parametric equation of a composite surface? 7 M
- b) What do you mean by blending function? Explain representation of a surface. 8 M

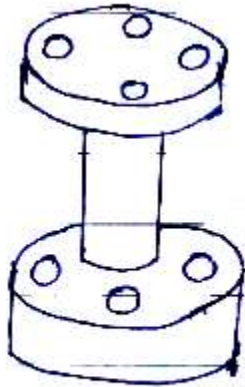
(OR)

6. a) What are various surface entities that are needed to construct a surface model? 7 M
- b) Derive parametric representation of the following surfaces: 8 M
- (i) Surface of revolution (ii) Tabulated cylinder
7. a) Explain about Boundary representation? 6 M
- b) Explain Half space modeling in detail and provide two examples? 9 M

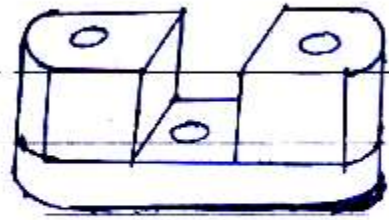
(OR)

8. a) Explain what are desirable properties of any solid modeling scheme? 6 M

b) Create a CSG model of the solids shown below and write Boolean operations to be performed? 9 M



(i)



(ii)