Code: 9A03806

R09

B.Tech IV Year II Semester (R09) Advanced Supplementary Examinations, July 2013
GEOMETRIC MODELING
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) Describe raster scan displays with a neat sketch. Explain the working principle, applications and limitations.
   (b) What are work station requirements and how these are different from desktop systems?

2 (a) Explain line and circle generation algorithms.
   (b) Explain polygon filling algorithms.

3 (a) Differentiate between:
        (i) Shearing and reflection and (ii) Concatenation and homogeneous representation.
   (b) A triangle A (0, 0), B (5, 2) and C (3, 5) is scaled about 'B' by (5, 5) units. Then find the new coordinates of the triangle ABC.

4 (a) What is viewing function? Explain the transformations from window to viewport.
   (b) Explain Sutherland-Hodgeman polygon clipping algorithm.

5 (a) What are the properties of spline? Explain how Bezier curve and surfaces are composed.
   (b) Describe continuity in Bezier and B spline curves.

6   The pyramid defined by the coordinates A (0, 0, 0), B (1, 0, 0) C (0, 1, 0) and D (0, 0, 1) is rotated 45^0 about the line L that has the direction $V = J + K$ and passing through point C (0, 1, 0), see figure 1. Find the coordinates of rotated figure.
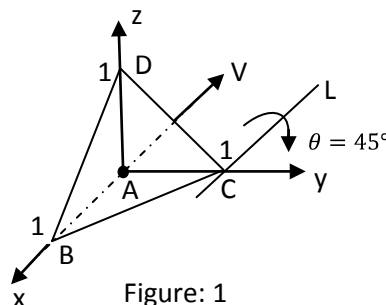

Figure: 1

7   Describe visible surface detection methods and their applications.

8   Describe in detail the computer animation and motion specifications with neat sketches.
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