S.E. (Computer Engg.) (Semester – II) Examination, 2010
COMPUTER GRAPHICS
(2003 Course)

Time : 3 Hours   Max. Marks : 100

Instructions : *1) Answers to the **two** Sections should be written in **separate***
books.
*2) **Black** figures to the **right** indicate **full** marks.*
*3) Assume **suitable** data, **if necessary**.*

SECTION – I

1. a) Explain Bresenham's line drawing algorithm. Using Bresenham's algorithm
   draw line from (1, 1) to (5, 3).   8

   b) Write short note on (**any two**) :   8
      a) Digitizer.
      b) Touch Panels.
      c) Joystick.

OR

2. a) Explain what is stroke method and bitmap method.   6

   b) Using DDA algorithm find out which pixels would be turn on for the line with
      end points [–1, –2] to [4, 8].   8

   c) Define pixel, vector.   2

3. a) Explain the concept of polygon fill and explain various polygon filling
      algorithms.   8

   b) Explain w.r.t. 2 D transformation :   8
      i) Scaling   ii) Rotation
      iii) Translation.

OR

4 a) What are the different types of polygon ? How to find whether given point is inside the polygon or not. 8

b) Perform the 45° rotation of triangle A (0, 0), B (1, 1), C (5, 2) :

   i) about the origin

   ii) about P (–1, –1). 8

5. a) What is animation and explain with suitable example how concept of segmentation is used for animation. 8

b) With the help of suitable example, explain Cohen-Sutherland outcode algorithm. 10

OR

6. a) Explain the segment table in detail and suggest the data structure used for segment table. 8

b) Describe Sutherland-Hodgeman polygon clipping algorithm with the example. Suggest its limitations. 10

SECTION – II

7. a) Explain :

   i) Parallel projection.

   ii) Perspective projection. 10

b) Explain various steps to perform rotation about X-axis, Y-axis and Z-axis in 3 D. 8

OR

8. a) Obtain the 3-D transformation matrices for :

   i) Scaling

   ii) Translation

   iii) Rotation about an arbitrary axis. 8

b) What is the necessity of 3-D clipping ? Explain any one 3-D clipping algorithm. 10

9. a) Explain binary space partition algorithm for hidden surfaces. **8**

   b) Explain phong shading and Gourand shading. **8**

   OR

10 a) Explain Warnock's algorithm for hidden line removal. **8**

   b) Why are hidden surfaces algorithms needed ? How does z-buffer algorithm determine which surfaces are hidden. **8**

11. a) Explain the curve generation methods with example. **8**

   b) What are fractals ? Explain how fractal surface is generated. **8**

   OR

12. a) What is fractal dimension ? Explain koch curve in detail, giving fractal dimension. **8**

   b) Compare Bezier and B-spline curves. **8**