

P1056**[4066]-502****T.Y. M.C.A. (Engineering Faculty)****COMPUTER GRAPHICS****(2008 Pattern) (710902) (New) (Sem. - V)****Time : 3 Hours]****[Max. Marks : 70****Instructions to the candidates:**

- 1) Answers to the two sections should be written in separate books.
- 2) Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 from section-I and Q. 7 or Q. 8, Q. 9 or Q. 10, Q. 11 or Q. 12 from section-II.
- 3) Neat diagrams should be drawn wherever necessary.
- 4) Figures to the right indicate full marks.
- 5) Assume suitable data, if necessary.

SECTION - I

- Q1)** a) Explain different character generation techniques. [6]
b) Explain DDA algorithm for circle drawing. [6]

OR

- Q2)** a) What is aliasing? Explain any two antialiasing techniques. [6]
b) Explain the following : [6]
i) Frame buffer.
ii) Vectors.
iii) Aspect ratio.

- Q3)** a) Explain the different methods for testing a pixel inside of polygon. [6]
b) Explain the following polygon filling algorithm. [6]
i) Seed fill.
ii) Edge-fill.

OR

- Q4)** a) Explain inverse transformation and derive the matrix for inverse transformation. [6]
b) Describe with respect to 2D transformation. [6]
i) Scaling.
ii) Rotation.
iii) Translation.

- Q5)** a) Why is segment used? How it is implemented using different data structures? [5]
b) Describe Sutherland Hodgman polygon clipping algorithm. State its limitations. [6]

OR

- Q6)** a) What are the advantages of using segmented display file? Explain with example the functions needed to maintain a segmented display file. [6]
b) Explain Cohen Sutherland outcode algorithm for line clipping. [5]

SECTION - II

- Q7)** a) Give the classification of perspective projection and compare parallel projection. [6]
b) Rotate object about z axis such that x-axis passes through a point $P(x_p, y_p, 0)$ in x - y plane. [6]

OR

- Q8)** a) What is the necessity for 3-D clipping and windowing algorithm? Explain any one 3-D clipping algorithm. [6]
b) Explain 3-dimensional transformation matrices for [6]
i) Translation.
ii) Scaling.
iii) Rotation about X, Y, Z axis.

- Q9)** a) How does Z buffer algorithm determine which surfaces are hidden? [6]
b) Compare RGB and HSV color model. [6]

OR

- Q10)** a) Explain Warnock's algorithm for hidden line removal. [6]
b) Explain Gouraud Shading and Phong Shading. [6]

- Q11)** a) Explain curve generation with example. [6]
b) Explain real time animation. [5]

OR

- Q12)** a) What is fractal dimension? Explain how fractal surfaces are generated? [6]
b) Explain the procedural method for controlling animation. [5]

