SOLVED MODEL QUESTION PAPER

Computer Graphics (As Per R -18 Pattern)

IIIrd Year B. Tech., Sem - I, (CSE / IT)(Professional Elective - II)

Time : 3 Hours]

[Maximum Marks : 75

Notes : This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

Q.1 a) What is scan conversion ? (Refer Q.3 of Chapter - 1)   [2]

b) State two algorithms to rasterize a line joining given end-points. (Refer Q.12 of Chapter - 2)   [2]

c) Scale the polygon with co-ordinates A (2, 5), B (7, 10) and C (10, 2) by two units in x direction and two units in y direction. (Refer Q.11 of Chapter - 4)   [2]

d) What is windowing and clipping ? (Refer Q.4 of Chapter - 5)   [2]

e) What is boundary representation ? (Refer Q.2 of Chapter - 6)   [2]

f) What is blobby object ? (Refer Q.4 of Chapter - 6)   [3]

g) Give the shear transformation matrices. (Refer Q.5 of Chapter - 7)   [3]

h) What is projection reference point ? (Refer Q.7 of Chapter - 8)   [3]

i) What is computer animation ? (Refer Q.1 of Chapter - 9)   [3]

j) Why are hidden surface algorithms needed ? (Refer Q.1 of Chapter - 10)   [3]

PART - B

(50 Marks)

Q.2 a) What is the role of following components in a CRT device ?
i) Control grid   ii) Focusing system   iii) Accelerating a node
v) Horizontal and vertical deflection plates. (Refer Q.5 of Chapter - 1)   [5]

b) Explain the DDA line drawing algorithm. (Refer Q.14 of Chapter - 2)   [5]

OR

Q.3 a) Derive the expression for decision parameter used in Bresenham's circle algorithm. Also explain the Bresenham's circle algorithm. (Refer Q.33 of Chapter - 2)   [5]

b) For what purpose winding number method is used ? What is a winding number ?
(Refer Q.4 of Chapter - 3)   [5]

Q.4 a) Scale the polygon with co-ordinates A (2, 5), B (7, 10) and C (10, 2) by two units in x direction and two units in y direction. (Refer Q.11 of Chapter - 4)   [5]

b) Explain viewing pipeline. (Refer Q.5 of Chapter - 5)   [5]

OR

Q.5 a) Find out composite transformation matrix to reflect a triangle with vertices A(-2, 1), B (-1, 2) and C (-2, 2) about line y = x + 2. Also find the coordinates of reflected objects. **(Refer Q.24 of Chapter - 4)** [5]

b) Explain the Cohen Sutherland line clipping algorithm. **(Refer Q.14 of Chapter - 5)** [5]

Q.6 a) List the properties of Bezier curve. **(Refer Q.18 of Chapter - 6)** [5]

b) Construct the B-spline curve of order 4 and with 4 polygon vertices A(1, 1), B(2, 3) C(4, 3) and D(6, 2). **(Refer Q.26 of Chapter - 6)** [5]

OR

Q.7 a) Explain the construction of Bezier curve using midpoint approach. Also give the algorithm for the same. **(Refer Q.21 of Chapter - 6)** [5]

b) Discuss the properties of B-spline curve. **(Refer Q.23 of Chapter - 6)** [5]

Q.8 a) Give 3D matrices for reflection relative to plane. **(Refer Q.4 of Chapter - 7)** [5]

b) Explain the general three-dimensional transformation pipeline with the help of example. **(Refer Q.1 of Chapter - 8)** [5]

OR

Q.9 a) A 3D cube dimensions (length, breadth and height) 2 units each is placed in a 3D anti-clockwise axis system such that one of its vertex "A" is at the origin. (i.e. (0, 0, 0)) and vertex "F" in 3D space. Apply necessary transformations such that vertex F becomes the origin. Give complete mathematical formulation. Draw initial and final state of the cube. **(Refer Q.7 of Chapter - 7)** [5]

b) Explain the parallel and perspective projection techniques to project 3D object onto 2D view plane. **(Refer Q.8 of Chapter - 8)** [5]

Q.10 a) Explain the steps for designing animation sequences. **(Refer Q.2 of Chapter - 9)** [5]

b) Write a short note on : Depth buffer method for detection. **(Refer Q.4 of Chapter - 10)** [5]

OR

Q.11 a) Explain, how hidden lines and surfaces are removed ? **(Refer Q.2 of Chapter - 10)** [5]

b) Explain various methods to specify the motion of the objects. **(Refer Q.10 of Chapter - 9)** [5]

END...