

Total No. of Questions : 8]

SEAT No. :

**P9141**

[Total No. of Pages : 2

[6179]-267

**S.E. (AIML)**

**COMPUTER GRAPHICS**  
**(2019 Pattern) (Semester-IV) (218555)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) Assume suitable data if necessary*

**Q1) a)** What is projection? Explain with diagram, perspective projection with vanishing points as 1 point, 2 point and 3 point. **[9]**

b) Let ABCD be the rectangle window with A (-20,-20) B (40,-20), C (40,30) and D (-20,30) Find the region code for endpoints and use cohen sutherland algorithm to clip the lines P1-P2 with P1 (-30,20) and P2 (60,-10). and Q1-Q2 with Q1 (-10,-30) and Q2 (20,60). Show graphic representation of Original and Clipped line. **[9]**

OR

**Q2) a)** Explain the concept of window, viewport, and viewing transformation. Find the normalization transformation window to viewport, with window, lower left corner at (3,3) and upper right corner at (6,8) onto a viewport, for entire normalized device screen. **[9]**

b) Let ABCD be the rectangle window with A (150, 150), B (150,200), C (200, 200) and D (200,150). Use Cohen Hodgeman polygon clipping algorithm to clip the convex polygon PQR with P (110, 180), Q (240,160), R (170, 110) and find the final coordinates of the clipped polygon. **[9]**

**Q3) a)** What is a segment? Why do we need segments? Explain the complete process of **[9]**

- i) Segment creation.
- ii) Segment Deletion and
- iii) Segment closing.

- b) Explain in detail with diagram. [8]  
i) Ambient light,  
ii) Diffuse light, and  
iii) Specular reflection.

OR

- Q4)** a) Explain in detail with diagram [9]  
i) HSV color model.  
ii) YCbCr color model  
iii) CIE Chromaticity Diagram.  
b) Define shading. Explain with help of diagrams phong shading algorithm in detail. [8]

- Q5)** a) What is curve interpolation? As far as splines are concerned what do Bezier and B-splines curve indicate? [9]  
b) Explain in detail with diagram how midpoint, subdivision method can be used for Bezier-Curve Generation. [9]

OR

- Q6)** a) Write short note on : [9]  
i) Methods of controlling animation.  
ii) Various types of animation languages.  
b) Why cubic Bezier curves are chosen? What are the properties of Bezier curve. Explain any Bezier Curve generation method. [9]

- Q7)** a) Explain the behavioral modeling in virtual reality. [6]  
b) What are sound displays in virtual reality? [6]  
c) What is navigation and manipulation interfaces in virtual reality system? [5]

OR

- Q8)** a) Explain the Graphics rendering pipeline. [6]  
b) Explain the applications of virtual reality systems. [6]  
c) Explain Kinematic modeling in Virtual reality. [5]

