Total No. of Questions : 8]

SEAT No. : ____

PC2833

[Total No. of Pages : 2

[6352]-57

S.E. (Information Technology)

COMPUTER GRAPHICS

(2019 Pattern) (Semester - IV) (214453)

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 indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) 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]**

b) What is projection? Explain with diagram, Perspective Projection with vanishing points as 1 point, 2 point and 3 point. **[9]**

OR

Q2) a) Explain the Concept of Window, Viewport, and Viewing transformations. 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

P.T.O.

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) Explain in detail with diagram how midpoint subdivision method can be used for Bezier-Curve Generation. **[9]**

b) What is curve interpolation? As far as splines are concerned what do Bezier and B-splines curves indicate? **[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 Curves. 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]**

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