M.C.A

(SEM V) THEORY EXAMINATION 2021-22

COMPUTER GRAPHICS AND ANIMATION

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.**

a. List the applications of computer graphics. 2 x 7 = 14

b. Give the limitations of DDA algorithm.

c. What is clipping? Explain the different types of clipping.

d. Discuss viewing, how it is different from clipping?

e. Differentiate between orthographic and oblique projections.

f. Write the properties of Bezier curves, also give its limitation.

g. What is ambient light?

SECTION B

2. **Attempt any *three* of the following:** 7 x 3 = 21

a. Discuss Digital Differential Analyzer (DDA) algorithm for drawing any line segment.

b. What is octant symmetry of a circle? Write mid-point circle algorithm for generating a circle having radius R and center at (Xc,Yc).

c. Explain Cohen-Sutherland line clipping algorithm to clip a line segment. Also draw a suitable diagram.

d. Translate a line segment having endpoints A(10,20) and B(50, 60), where the translation vectors are (Tx,Ty)=(2,3). Find the new coordinates?

e. What is composite transformation? Give matrix representation for rotation about pivot point.

SECTION C

3. **Attempt any *one* part of the following:** 7 x 1 = 7

(a) Explain boundary fill algorithm for filling any polygon by applying 4-connected method. Also write the pseudo code for the same.

(b) What is reflection? Reflect a point having coordinate P(100,200) about X-axis.

4. **Attempt any *one* part of the following:** 7 x 1 = 7

(a) Explain the need of projection? Comment on the statement "Projections of distant object are smaller than projections of objects of same size that are closer to projection plane".

(b) Write Depth buffer algorithm for identifying visible surfaces. What is the use of depth buffer and refresh buffer?

5. **Attempt any *one* part of the following:** 7 x 1 = 7

(a) Approximate a Bezier curve having control points A(20,30), B(10,40), C(30,40) and D(20,10). Also draw the figure.

(b) Give the advantage of B-spline curve over Bezier curve. How B-Spline is represented mathematically?

6. **Attempt any *one* part of the following:** 7 x 1 = 7

(a) What is viewing? Give window to viewport mapping.

(b) Discuss the different techniques of image processing.

7. **Attempt any *one* part of the following:** 7 x 1 = 7

(a) Discuss the various techniques for creating the animation of an object.

(b) Explain the concept of storyboard and keyframing in context to animation.

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