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B.TECH
(SEM V) THEORY EXAMINATION 2021-22
COMPUTER GRAPHICS

*Time: 3 Hours**Total Marks: 100***Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. What is the difference between Raster and Random Scan?
 - b. What is the role of a frame buffer in raster method?
 - c. What is the difference between computer graphics and image processing?
 - d. Distinguish between pixel ratio and aspect ratio.
 - e. What is the difference between generation of character by stroke and bitmap method?
 - f. What do you mean by 3-D geometry?
 - g. What do you mean by composite transformation?
 - h. Explain 2 D Translation with diagrams.
 - i. List the properties of Bezier Curves.
 - j. What is Specular reflection.

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. What do you understand by shadow mask CRT? Give its advantages and disadvantages.
 - b. Explain 3-dimensional clipping? What are the problems that are encountered in perspective projections?
 - c. What do you understand by clipping? Give Liang Barsky's line clipping algorithm.
 - d. Explain reflection in detail. What is reflection about an arbitrary line?
 - e. Draw a simple Illumination model. Include the contribution of Diffuse, Ambient and Specular Reflection.

SECTION C

- 3. Attempt any one part of the following: 10 x 1 = 10**
- (a) Consider two raster systems with resolutions of 640* 480 and 1280* 1024. How many pixels could be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second?
 - (b) Consider the line from (5, 5) to (13, 9). Use the bresenham algorithm to rasterize the line.



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4. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Use the Cohen –Sutherland algorithm to clip line $P_1 (70, 20)$ and $P_2 (100, 10)$ against a window lower left hand corner $(50, 10)$ and upper right hand corner $(80, 40)$.
 - (b) Obtain the mirror reflection of the triangle formed by the vertices $A(0,3), B(2,0)$ and $C(3,2)$ about the line passing through the points $(1,3)$ and $(-1, -1)$.
5. Attempt any *one* part of the following: 10 x 1 = 10
- (a) What is window-to-view point coordinate transformation? What are issues related to multiple windowing?
 - (b) What do you mean by projection? Differentiate between parallel projection and perspective projection.
6. Attempt any *one* part of the following: 10 x 1 = 10
- (a) What do you understand by the term “Back- Face Removal”? Explain a Back-Face Removal algorithm, you find convenient to implement. Justify your answer.
 - (b) Explain Z-Buffer algorithm.
7. Attempt any *one* part of the following: 10 x 1 = 10
- (a) What do you understand by quadratic surfaces
 - (b) Explain the difference between: -
 - (i) Bezier and B-Spline curves
 - (ii) Bezier and Hermite curves

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