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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