PAPER ID-310865

Roll No:

BTECH
(SEM V) THEORY EXAMINATION 2023-24
COMPUTER GRAPHICS

TIME: 3 HRS **M.MARKS: 100**

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

SECTION A

1. **Attempt *all* questions in brief.** **2 x 10 = 20**

Qno.	Question	Marks	CO
a.	Why is the slope-intercept form commonly used for representing lines in computer graphics?	2	CO1
b.	Describe how a point is represented in a computer graphics system.	2	CO1
c.	Explain the Bresenham line drawing algorithm briefly.	2	CO2
d.	Discuss the significance of parallel versions of line drawing algorithms.	2	CO2
e.	How does the Sutherland-Hodgman polygon clipping algorithm work?	2	CO3
f.	Discuss the significance of text clipping in graphical applications.	2	CO3
g.	What is a projection in the context of 3-D viewing?	2	CO4
h.	What role do matrices play in 3-D transformations?	2	CO4
i.	What are blobby objects in computer graphics?	2	CO5
j.	What is the significance of specular reflection in rendering?	2	CO5

SECTION B

2. **Attempt any *three* of the following:** **10 x 3 = 30**

a.	Describe a scenario where a random scan display is preferable over a raster scan display. Also, State a key advantage of raster scan displays over random scan displays.	10	CO1
b.	Elaborate the midpoint circle generating algorithm, outlining its principles and benefits.	10	CO2
c.	Define composite transformations and illustrate how they are constructed by combining basic transformations. Explain with examples how multiple transformations are applied successively to achieve a composite transformation.	10	CO3
d.	Discuss various methods used in 3-D clipping. Explain their advantages and drawbacks.	10	CO4
e.	Describe the concept of splines in computer graphics, highlighting their use and significance.	10	CO5

SECTION C

3. **Attempt any *one* part of the following:** **10 x 1 = 10**

a.	Explain the function of a video controller in a graphics system.	10	CO1
b.	Discuss in detail the two primary types of computer graphics: vector graphics and raster graphics. Compare and contrast their fundamental characteristics, applications, and advantages in various industries.	10	CO1

4. **Attempt any *one* part of the following:** **10 x 1 = 10**

a.	Explain the fundamental characteristics of Digital Differential Analyzer (DDA) and Bresenham's line drawing algorithms, discussing their respective strengths and weaknesses in rendering lines in computer graphics.	10	CO2

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b.	What are the criteria that should be satisfied by a good line drawing algorithm? Explain.	10	CO2

5.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

a.	Compare and contrast the Cohen-Sutherland and Liang-Barsky algorithms in terms of their computational complexity, efficiency, and handling of various types of clipping scenarios.	10	CO3
b.	Elaborate on curve clipping techniques in computer graphics. Discuss the challenges and methods involved in clipping curves, highlighting the key algorithms used.	10	CO3

6.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

a.	Explain the stages involved in a typical 3-D transformation pipeline.	10	CO4
b.	Compare and contrast orthographic and perspective projections in 3-D viewing.	10	CO4

7.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

a.	Compare and contrast the A-buffer method and the depth buffer method in terms of efficiency and complexity.	10	CO5
b.	Elaborate on the components and calculations involved in the Phong illumination model. How does it contribute to realistic rendering?	10	CO5