Seat No: .....

Enrollment No: .....

PARUL UNIVERSITY
FACULTY OF IT & COMPUTER SCIENCE
MCA/M.Sc.(IT), Summer 2024-25 Examination

Semester: 2
Subject Code: 05201330/05202182
Subject Name: Computer Graphics

Date: 14-05-2025
Time: 02:00 pm to 04:30 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Make suitable assumptions whenever necessary.
3. Write the answers for both sections on separate answer sheets.

SECTION - A [30 Marks]				
Q1	**Answer the following questions:**	**[20]**	**CO**	**BT**
(a)	Answer **all** questions	(5)		
i.	What is the primary purpose of the Midpoint Circle Algorithm? (A) To draw straight lines efficiently. (B) To fill polygons with color. (C) To generate pixels for drawing circles. (D) To create complex animations.	1	CO1	BT1
ii.	What is the purpose of hidden surface removal in computer graphics? (A) To enhance the color of surfaces (B) To eliminate surfaces not visible to the viewer (C) To reduce rendering time (D) To simplify geometric shapes	1	CO3	BT2
iii.	What does DDA stand for in the DDA line-drawing algorithm?	1	CO1	BT1
iv.	Why is clipping necessary in rendering 3D graphics?	1	CO3	BT2
v.	Define the term "3D representation."	1	CO2	BT1
(b)	Attempt Any **Five** Questions out of Seven	(15)		
i.	Discuss the differences between drawing a circle and an ellipse using the Midpoint approach.	3	CO1	BT2
ii.	Demonstrate how to transform a window into a viewport using a given transformation matrix.	3	CO2	BT3
iii.	Explain how back-face culling reduces the number of polygons processed during rendering.	3	CO2	BT2
iv.	Show how a circle can be drawn using the Midpoint Circle algorithm.	3	CO1	BT3
v.	Explain the significance of light sources in the illumination model and how they affect scene rendering.	3	CO2	BT2

vi.	Demonstrate how Bresenham's Circle Algorithm can be used to draw a circle with a radius of 10 at the point (3, 3).	3	CO1	BT3
vii.	Apply the RGB color model to represent a given color with values (255, 0, 0). How would this color be represented in the HSV model?	3	CO2	BT3
Q2	**Answer/Solve following in detail (Attempt any 2 out of 3)**	**[10]**		
(a)	Create a simple example where you apply both the DDA and Bresenham's algorithms to draw a line. Compare the results in terms of efficiency and output quality.	5	CO1	BT3
(b)	Evaluate the role of 3D transformations in computer animation. How do they enhance the realism of animated sequences?	5	CO3	BT5
(c)	Analyze the effects of different clipping algorithms (e.g., Cohen-Sutherland vs. Liang-Barsky). What are the advantages and disadvantages of each?	5	CO3	BT4

SECTION - B [30 Marks]

Q1	**Answer the following questions:**	**[20]**	**CO**	**BT**
(a)	Answer **all** questions	(5)		
i.	What does the term "intensity" refer to in the context of color attributes for output primitives? (A) The brightness of a color. (B) The type of color model used. (C) The color depth of the display. (D) The geometric transformations applied.	1	CO1	BT1
ii.	Which of the following actions can you perform using the timeline controls? (A) Import external files only (B) Play, stop, and control the timing of animations (C) Edit text fields exclusively (D) Export projects to video formats only	1	CO4	BT2
iii.	What is the basic syntax structure of a MATLAB command?	1	CO4	BT1
iv.	Describe how rotation is performed around the origin.	1	CO3	BT2
v.	What is motion tweening, and how is it used in Flash?	1	CO4	BT1
(b)	Attempt Any **Five** Questions out of Seven	(15)		
i.	What are MATLAB toolboxes, and how do they enhance the functionality of the base MATLAB software?	3	CO4	BT2
ii.	Compare and contrast the play() and stop() functions in terms of their effects on user interaction within a Flash project.	3	CO4	BT4
iii.	Illustrate how to use Action Scripting to control the visibility of layers in a Flash animation.	3	CO4	BT3
iv.	Analyze the differences between the various edge detection methods available in MATLAB. How does the Canny method compare to the Sobel method?	3	CO4	BT4

Explain basic 3D trans formation in CG

v.	Discuss the implications of using startDrag() in an application. What considerations should be taken into account to ensure a good user experience?	3	CO4	BT4
vi.	How can composite transformations help in reducing computational complexity?	3	CO3	BT4
vii	Create an animation sequence where an object changes color and position simultaneously using motion tweening.	3	CO4	BT3
Q2	**Answer/Solve following in detail (Attempt any 2 out of 3)**	**[10]**		
(a)	Compare the efficiency of for loops and vectorized operations in MATLAB. What are the performance implications?	5	CO4	BT4
(b)	Evaluate the significance of interactivity in multimedia animations created with Flash. How does it affect user engagement?	5	CO4	BT5
(c)	Analyze the efficiency of the scan line filling algorithm compared to the boundary fill algorithm. In what situations would you prefer one over the other?	5	CO1	BT4