H Roll No. .....

TMC–401

M. C. A. (FOURTH SEMESTER) END SEMESTER EXAMINATION, May, 2022

GRAPHICS AND VISUAL COMPUTING

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) What is aliasing and anti-aliasing ? (CO2)

(b) Calculate the pixel points along a straight line whose end points are A (30, 40) and B (50, 60). (CO2)

(c) Discuss Bresenham ellipse drawing algorithm. (CO2)

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2. (a) Write mid-point circle algorithm and apply that algorithm to find the pixel values of the circle whose radius $r = 4$ and center of the circle is (0, 0). (CO4)

   (b) Explain Cohen Sutherland Line clipping method with an example. (CO4)

   (c) Explain Weiler Atherton Polygon Clipping method. (CO4)

3. (a) Define Window and Viewport. Derive window to viewport transformation. (CO1)

   (b) What is meant by parallel and perspective projection ? Derive the matrix for perspective projection. (CO1)

   (c) What is the difference between geometric and coordinate transformations ? Discuss the various 2D geometric transformations. (CO1)

4. (a) Given control points (10, 100), (50, 100), (70, 120), (100, 150). Calculate coordinates of any *four* points lying on the corresponding B-spline curve. (CO3)

   (b) What is shading ? Discuss various forms of shading. (CO3)

   (c) Describe the boundary fill algorithm with 4 connected pixels. Discuss with a suitable example. (CO3)

5. (a) What is Visualization and discuss its application ? (CO5)

   (b) Discuss Painter's algorithm. (CO5)

   (c) Write short notes on the following : (CO5)

   (i) Morphing

   (ii) Shading

   (iii) Fractal Graphics