Slip No:___ Exam Seat No.:_____

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

FS BE-III CSE Examination

Day: Friday Date: 1-12-2023 Year: 2023-24 Time: 3 PM to 6 PM

SUBJECT: CSE1502 Computer Graphics

Instructions: 1) This paper contains two sections 40 marks each.
2) Q1 & Q4 are compulsory.
3) Figures to the right indicate full marks.

SECTION-I

Q-1 (A) What is CRT? Explain functioning of CRT with diagram (6)

(B) What are the anti-aliasing techniques? Explain in details. (6)

Q-2 Derive decision parameter for Bresenham Line drawing algorithm. (7)

OR

Q-2 Calculate coordinates for line with end points A(20, 10) and B(30, 18) using Midpoint Line drawing. (7)

Q-3 Answer the following (Any three) (21)

i) How does 3D shearing different from 2D shearing. Explain with example.
ii) Given a triangle with coordinate points A(3,4,1), B(6,4,2), C(5,6,3). Apply the translation with distance 1 towards X axis and 1 towards Y axis & towards Z axis. Obtain new coordinates.
iii) What is projection? Explain different types of Projection.
iv) Write a short note on Emissive Vs Non-emissive displays

SECTION-II

Q-4 (A) Write Sutherland-Hodgeman Polygon clipping algorithm. How does it differ from Weiler-Atherton Polygon clipping? (6)

(B) Derive 3D transformation matrices for rotation of an object by an angle of θ about arbitrary axis. (7)

Q-5 (A) Define following term: (3)
(a) pixel (b) viewport (c) model coordinate

(B) Explain Boundary fill algorithm. (3)

OR

Q-5 (A) What do you mean by scaling? Explain 3D scaling with example. (6)

Q-6 Answer the following (Any three) (21)

i) Beam Penetration Vs Shadow Mask Method
ii) Explain the 3D viewing pipeline.
iii) Given the centre point coordinates (4,4) and radius 10, generate all the points to form a circle in Mid Point Circle Algorithm.
iv) List out input devices and explain them in details.
v) A triangle with coordinates A(2, 2), B(4, 2) and C(4, 4) is rotated by an angle of 180^0 and reflected about y = -x. Find out the new coordinates of the triangle.