M.Sc. (MATHEMATICS WITH APPLICATIONS IN COMPUTER SCIENCE)
M.Sc. (MACS)

Term-End Examination

December, 2022

MMTE-004 : COMPUTER GRAPHICS

Time : $1\frac{1}{2}$ hours *Maximum Marks : 25*

(Weightage : 50%)

Note : *Question no.* ***1*** *is* ***compulsory****. Attempt any* ***three*** *questions out of questions no. 2 to 5. Use of calculators is* ***not*** *allowed.*

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1. State whether the following statements are true or false. Justify your answers with a short proof or a counter-example. *5×2=10*

(a) A perspective projection preserves relative proportions.

(b) The reflection about the line $y = -x$ is attained by reversing the x, y coordinates.

(c) Raster scanning is better than random scanning technique used in display.

(d) In general, scaling and rotation are commutative operations.

(e) Boundary fill algorithm is suitable for regions with boundary having more than one colour.

2. (a) Magnify the triangle P(0, 0), Q(2, 2) and R(10, 4) to four times its size while keeping R(10, 4) fixed. *3*

(b) Write two differences between shear transformation and composite transformation. *2*

3. For a polygon with the vertices V_0 = (10, 20), V_1 = (20, 0), V_2 = (30, 10), V_3 = (40, 0), V_4 = (40, 40), V_5 = (30, 30), V_6 = (20, 40) and V_7 = (30, 20), prepare an initial sorted edge list and then make the active edge list for scan lines y = 5, 20, 30, 35. *5*

4. Use the Cohen-Sutherland algorithm to clip the line P_1 (70, 20) and P_2 (100, 10) against a window with lower left hand corner (50, 10) and upper right hand corner (80, 40). *5*

5. Find the equation of the Bezier curve passing through (0, 0) and (– 4, 2) and controlled by (14, 10) and (4, 0). *5*