** MGM’s College of Engineering and Technology, Kamothe, Navi Mumbai**

**[AY 2021-22]**

**Branch: Computer Engineering Semester: III CBCGS (C Scheme)**

**Class: SE (A) Subject: CG**

**ASSIGNMENT NO.2**

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|  | **Question** | **Module** | **Bloom’s Taxanomy level** | **Program Indicator (PI)** | **CO** |
| **Q1. Choose Correct Options / Fill in the blanks** | |  |  |  |  |
| **a** | The aliasing effect can be minimized by?   1. decreasing resolution of the raster display 2. by increasing slope of the line 3. **increasing resolution of the raster display** 4. by decreasing slope of the line | M2 | L2 | 2.1.2 | CO2 |
| **b** | Pixel is one of the antialiasing techniques. | M2 | L1 | 2.1.2 | CO2 |
| **c** | Which of the following is the correct representation to define 2D point using homogeneous coordinate [Hint: - (Xw, Yw, w)]   1. (0,0,0) 2. (4,4,0) 3. **(0,0,1)** 4. (1.5,1.8,0) | M3 | L2 | 2.1.2 | CO3 |
| **d** | If the scaling factors values of Sx = 1 and Sy = 1 then   1. **Size of an object remains same** 2. Size of an object is increased 3. Size of an object is reduced 4. It slants the shape of an object | M3 | L1 | 2.1.2 | CO3 |
| **e** | The negative values of ‘θ’ gives rotation. (clockwise) | M3 | L2 | 2.1.2 | CO3 |
| Q2. **C Q2. Choose Correct Options/ Fill in the blanks** | |  |  |  |  |
| **a** | A circle is drawn at (30,30) with radius = 10. Its mirror image cannot be obtained by?   1. Rotation by 900 2. Reflection about Y-axis 3. **Translation by Tx = 60 and Ty = 0** 4. Scaling by Sx = -1 and Sy = 1 | M3 | L2 | 2.1.2 | CO3 |
| **b** | A conceptual line is drawn starting from the particular point and extending to a distance point outside the coordinate extends of the object in direction of X-axis, the line intersects twice with the polygon edges and once with the polygon vertex. Then according to inside outside test, the point lies?   1. Outside the polygon 2. Inside the polygon 3. On the boundary of the polygon 4. **Cannot say** | M2 | L3 | 2.1.2 | CO2 |
| **c** | Which of the following input is accepted only by Boundary Fill method and not by Flood fill method?   1. Fill color 2. Background color 3. **Edge color** 4. Seed pixel | M2 | L2 | 2.1.2 | CO2 |
| **d** | To convert a square into a parallelogram, which transformation is used?   1. Scaling 2. X-Shear 3. Y-Shear 4. **X-Shear or Y-Shear or both X and Y Shear** | M3 | L2 | 2.1.2 | CO3 |
| **e** | First reflect a point about x-axis, then perform a counter clock wise rotation of 900, this is equivalent to Reflection about a line . X=Y | M3 | L2 | 2.1.2 | CO3 |
| **Q3. Answer the following questions in brief (20 to 30 words)** | |  |  |  |  |
| **a** | Explain homogeneous coordinates in computer graphics. | M3 | L1 | 2.1.2 | CO3 |
| **b** | What is aliasing effect? Discuss any one antialiasing technique. | M2 | L2 | 2.1.2 | CO2 |
| **c** | Compare flood fill and boundary fill algorithm. | M2 | L2 | 2.1.2 | CO2 |
| **Q4. Answer the following questions in brief (50 to 70 words)** | |  |  |  |  |
| **a** | Scale the square ABCD with coordinates A (0,0), B (5,0), C (5,5), D (0,5) by 3 units in x direction and 4 units in y direction. | M3 | L1 | 2.1.2 | CO3 |
| **b** | Derive 2- D composite transformation matrix to reflect the point (x, y) about the fixed point (Xp, Yp)(point other than the origin) | M3 | L2 | 2.1.2 | CO3 |
| **c** | Apply Xshear and Yshear transformation to the square with coordinates P(0,0) , Q(3,0), R(3,-3) and S(0, -3), xshear parameter value and yshear parameter value is 2. | M3 | L1 | 2.1.2 | CO3 |
| **d** | What do you mean by Scan Line polygon fill algorithm? Explain in detail. | M2 | L1 | 2.1.2 | CO2 |
| **Q5. Think and Answer** | |  |  |  |  |
| **a** | What is homogeneous transformation matrix for 2D. Write homogeneous transformation matrix for Translation, Rotation and Scaling in terms of P'=P\*T (Where P= Original object matrix, and P'=New object matrix and T= 2D transformation matrix) | M3 | L2 | 2.1.2 | CO3 |
| **b** | Prove that 2D rotations are additive. | M3 | L3 | 2.1.2 | CO3 |
| **Q6.** **My Ideas** | |  |  |  |  |
| **a** | Derive the composite matrix to scale an object with respect to a fixed point. | M3 | L2 | 2.1.2 | CO3 |
| **b** | Develop function/procedure to fill color in to the above polygon using 8 connected approach. | M3 | L3 | 2.1.2 | CO3 |