(c) Prove that simultaneous shearing in both directions (x & y direction) is not equal to the composition of pure shear along x-axis followed by pure shear along y-axis.(CO4)

5. (a) Explain the principle of animation and different types of animation. (CO5)

(b) Briefly discuss about GKS standard and primitives. (CO5)

(c) Discuss and differentiate between parallel and perspective projection. (CO5)

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TBC–601/TBI–602

B. C. A./B. Sc. (IT)

(SIXTH SEMESTER)

END SEMESTER

EXAMINATION, June, 2023

COMPUTER GRAPHICS

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 computer graphics ? Briefly discuss about the application of computer graphics. (CO1)

P. T. O.

(b) Briefly discus about the working of LCD and Plasma Panels. (CO1)

(c) Explain the following terms : (CO1)

(i) Delta-Delta shadow masking

(ii) Beam penetration method

2. (a) Derivate the mid-point circle generation algorithm. (CO2)

(b) Explain window to viewport transformation with suitable example. (CO2)

(c) Explain the terms : (CO2)

(i) Aspect Ratio

(ii) Persistence

(iii) Antialiasing

(iv) Raster and Random display devices

3. (a) Differentiate between Sutherland Hodgeman and Weiler Atherton polygon clipping algorithm. (CO3)

(b) Illustrate the flood fill and boundary fill algorithm. (CO3)

(c) Differentiate between concave and convex polygon. Use the Cohen Sutherland algorithm to clip line L1 (60,10) to (90,10) and L2 (30, 5) to (60, 20) against a window lower left hand corner (40,10) and upper right hand corner (80,40). (CO3)

4. (a) What do you mean by basic transformation? Derivate the matrices for all types of 2D transformation. (CO4)

(b) Derivate the matrices for all 3D transformation techniques. Demonstrate local scaling taking scaling factors along the x, y and z axes as 2, 3 and 1 respectively, for a cube with homogeneous position vectors : (CO4)

$$[x] = \begin{bmatrix} 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}$$