

# P P SAVANI UNIVERSITY

Fourth Semester of B. Tech. Examination

May 2019

SECE2051 Computer Graphics & Multimedia

22.05.2019, Wednesday

Time: 09:00 a.m. To 11:30 a.m.

Maximum Marks: 60

## Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

### SECTION - I

Q - 1 Answer the following (Any Five) [05]

- (i) Define Persistence.
- (ii) List out the methods used for color CRT display.
- (iii) Define Horizontal and Vertical Retrace.
- (iv) Brightness of the line is dependent on orientation. Justify.
- (v) Define Interlaced Display.
- (vi) What is called Video Adapter Card?
- (vii) What is called refreshing?

Q - 2 (a) Briefly explain graphics input devices. [05]

Q - 2 (b) Write an algorithm to scan convert a line using DDA line drawing algorithm. Also derive the equations for line having slope  $< 1$ . Write the pseudo code for generating dotted line (Like ..... ) using the derived equations. [05]

OR

Q - 2 (a) Explain working of raster scan display. [05]

Q - 2 (b) Derive the equations to scan convert a line using Mid-point line drawing algorithm. Consider the line with slope  $< 1$ . Also write a pseudo code to draw the line having width of 3 pixels. [05]

Q - 3 (a) Consider a polygon with vertices A(2,2), B(7,2), C(7,8) and D(2,8). Clip a line PQ having vertices P(1,3), Q(9,9) against polygon ABCD using Cohen Sutherland Line clipping algorithm. [05]

Q - 3 (b) Explain boundary fill algorithm with its merits and demerits. [05]

OR

Q - 3 (a) Reflect the diamond shape polygon having vertices A(-1,0), B(0,-2), C(1,0) and D(0,2) about line  $y = x + 2$  (diagonal line). Find the coordinates of reflected polygon. [05]

Q - 3 (b) Explain flood fill algorithm with its merits and demerits. [05]

Q - 4 Attempt any one. [05]

(i) Find the conditions under which we can switch the order of a rotation and simultaneous shearing and still get the same result. [05]

(ii) Briefly explain working of Weiler Atherton Polygon clipping algorithm.

### SECTION - II

Q - 1 Answer the following (Any Five) [05]

- (i) List different methods for 3D display.
- (ii) State the properties of light.
- (iii) Write 3D rotation (with reference to X, Y and Z axis) matrices.
- (iv) What is Unicode Standard?
- (v) Which are text compression techniques?
- (vi) Name a few audio editing software.
- (vii) Define vanishing point.

Q - 2 (a) The pyramid defined by the coordinates A(0,0,0), B(1,0,0), C(0,1,0) and D(0,0,1) is to be rotated 45 about line L that has direction vector  $V = J + K$  and passing through point C(0,1,0). Find the composite transformation matrix. [05]

Q - 2 (b) Differentiate between perspective projection and parallel projection. Give schematic diagram to explain the same. [05]

OR

Q - 2 (a) Find the transformation matrix for 3D mirror reflection with respect to the plane passing through origin and having a normal vector having direction  $N = I + J + K$ . [05]

Q - 2 (b) Find the general form of an oblique projection on the xy plane. [05]

Q - 3 (a) Differentiate between diffuse reflection and specular reflection. [05]

Q - 3 (b) Write the applications of different color models. Explain any one-color model in brief. [05]

OR

Q - 3 (a) Explain Depth buffer (z-buffer) algorithm. [05]

Q - 3 (b) Explain Bezier curve and derive the equations of  $G_1$  and  $C_1$  continuity. [05]

Q - 4 Attempt any one. [05]

(i) Briefly explain digital audio & video processing with applications.

(ii) Briefly explain different methods of Polygon mesh representation.

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