

- (b) Derive general form of scaling matrix w.r.t. a fixed point  $P(h,k)$ . 6
7. (a) A square with vertices (0,0), (0,2), (2,0) and (2,2) is rotated by an angle of  $45^\circ$  (anti-clockwise) about the vertices (2,2). Determine co-ordinates of the vertices after rotation of the figure. Will the figure remain square? 7
- (b) Prove that generally successive scaling transformation and rotation are not commutative. Hence find the cases in which both are commutative. 7

#### Unit IV

8. (a) Explain Cohen Sutherland Algorithm for the line clipping with the help of a suitable example. 7
- (b) Find the normalized transformation that maps a window whose lower left corner is at (1,1) and upper right corner is at (3,5) onto :
- (i) A viewport that is the entire normalized device screen.

Subject Code—52867

### B.C.A. EXAMINATION

(Batch 2017 Onwards)

(Main/Re-appear)

(Fifth Semester)

COMPUTER GRAPHICS

BCA-355

*Time : 3 Hours*

*Maximum Marks : 70*

**Note :** Attempt *Five* questions in all. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) Differentiate between Interactive and Passive graphics. Also explain advantage of Interactive computer graphics.
- (b) Define the terms Window, View plane, Clipping, Viewing Transformation.

- (c) Explain the difference between parallel and perspective projection.
- (d) Explain the basic principle for removal of hidden lines/hidden surface removal.
- (e) Explain the advantages of hard copy devices over soft copy devices in computer graphics.
- (f) Explain the importance of Look Up Table with a neat diagram.
- (g) Differentiate between Parallel and Perspective projection. 7x2=14

### Unit I

- 2. (a) Explain the working principle of Plasma Panel Display devices with diagram. 10
- (b) Define the terms Display Processor, Frame Buffer, Aspect Ratio, Look Up Table. 4
- 3. (a) Explain any *five* Real Life applications of Computer Graphics. 8

- (b) Compare :
  - (i) Refresh CRT and DVST.
  - (ii) Beam Penetration and Shadow Mask technique. 6

### Unit II

- 4. (a) What are the steps required to plot a line ? 10
- (b) What do you mean by Scan Conversion ? What are the major side effects of Scan Conversion ? 7
- 5. Define the terms aliasing and anti-aliasing. Compare weighted and un-weighted anti-aliasing with suitable example 14

### Unit III

- 6. (a) Describe the following terms :
  - (i) Gravity Field Positioning Constraint
  - (ii) Rubber Band Technique 8

(ii) A viewport that has lower left corner at (0,0) and upper right corner at (0.5, 0.5). 7

9. (a) Explain Scan line algorithm for hidden lines/hidden surface removal. 10
- (b) Define the terms Depth Cuing, Vanishing Point, Lines of Projections, Centre of Projection. 4

(ii) A viewport that has lower left corner at (0,0) and upper right corner at (0.5, 0.5). 7

9. (a) Explain Scan line algorithm for hidden lines/hidden surface removal. 10
- (b) Define the terms Depth Cuing, Vanishing Point, Lines of Projections, Centre of Projection. 4