ᷣCA 4th Semester Examination, 2013

GRAPHICS LAB

PAPER — 406

Full Marks : 50

Time : 3 hours

Answer any **one** question selecting
it by a lucky draw

1. Write a program to implement Bresenham's
   circle generation algorithm.

2. Write a program to print the first character of
   your name using any standard line drawing
   algorithm.

3. Write a program to draw two concentric circle
   using parametric circle generation algorithm.

4. Write a program to do the following transformation on the triangle defined by

$$\begin{bmatrix} 40 & 80 & 80 \\ 40 & 40 & 80 \end{bmatrix}$$

(*i*) 90° rotation about origin then

(*ii*) reflection about line $y = -x$ on the rotated object.

5. With the help of program show that a 2D reflection through X-axis followed by a 2D reflection through the line $y = -x$ is equivalent to pure rotation about the origin. (Rotation about origin by an angle $\theta = 270°$ is pure rotation).

6. Write a program to draw a polygon using DDA line drawing.

7. Write a program to fill a polygon using any standard filling algorithm.

8. Write a program to show that the reflection along the line $y = x$ is equivalent to the reflection along X-axis followed by counter clockwise rotation by 90°. .

9. Write a menu driven program that will do the following using a polygon

   (i) X-axis shear

   (ii) Differential scaling w.r.t. an arbitary point.

10. Write a program to show all the standards of 2D reflections.

11. Applying a 2D rotation followed by a scaling transformation is same as applying first the scaling transformation and then rotation. Justify with the help of a program.

12. Write a program to work out the transformation matrix which would rotate a triangle located at P(10, 40) Q(40, 40), R(40, 30) by 90 degrees (CCW) about point Q. Also display the transformation matrix and the co-ordinates of the rotated triangle.
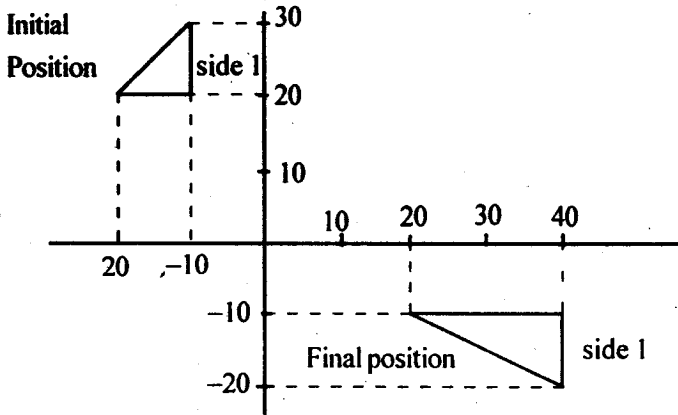
13. Write a program to draw the below figure without using inbuilt functions.
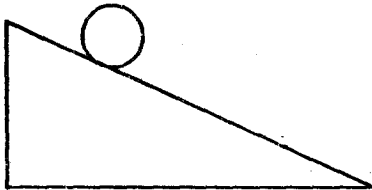
14. Write a program to implement Cohen Sutherland line clipping algorithm.

**15.** For the following figure generate and display the transformation matrix.

16. Write a program to do the following transformation in sequence in any object.

(*i*) Scaling the object by $sx = 3 = sy$.

(*ii*) Rotating the Scaled object by an angle 60°.

(*iii*)Reflecting the rotated object along X-axis.

17. Write a program to draw the following figure using Bresenham's line drawing algorithm.
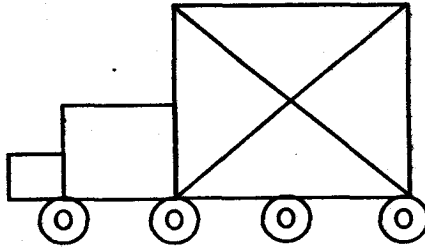
18. With the help of the program prove that a pair of parallel straight lines remain parallel even after transformation by the general 2 × 2 transformation matrix.

[PNB + Viva — 15 Marks]

Marks Distribution
1. Brief Description of Problem — 10 %
2. Program listing — 40 %
3. Result and Discussion — 30 %
4. Viva-voce — 20 %