2015

M.Sc.

1st Semester Examination

COMPUTER SCIENCE

PAPER—COS-106

(PRACTICAL)

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

All notations have their usual meaning.

(*Graphics Lab*)

Answer any *one* questions 20

1. Write a program to draw a hexagon using Bresenham's line drawing algorithm.

2. Write a program to draw a circle using mid-point circle drawing algorithm.

3. Write a program to rotate a triangle about origin.

4. Write a program to show all standards of shear transformation.

5. Write a menu driver program to translate, scale and rotate a line about the origin.

6. Write a program to draw an ellipse using ellipse drawing algorithm.

7. Write a program to clip a line segment.

8. Write a program to do the following transforms in sequence :

   (i) 90° rotation of a line about origin.

   (ii) reflection about line y = 0.

9. Write a program to translate a rectangle.

10. Write a program to implement 2D reflection based on line y = mx + c, where m and c is user input.

11. A polygon has 4 vertices located at A (0, 0) B (5, 10), C (15, 10), D (10, 0). Illustrate the effect of (i) x-share and (b) y-shear on the given polygon. You may assume the shear factor a=3 and b=4.

12. Draw a Bezier curve having the control points as P1 (0,0), P2 (5, 10), P3 (30, 9), P4 (40, 10). Calculate the coordinates of the points on the curve corresponding to the parameter t = 0·2, 0·4, 0·6.

13. A polygon has 4 vertices located at A (0,0), B (5, 5), C (5, 5), D (0, 5). Apply the following transformations on the polygon : (i) Scaling and (ii) xy shear about the orgin.

14. Assume that a triangle ABC has the coordinates A (0, 0), B (4, 4), C (2, 2). Find the transformed coordinates when the triangle ABC is subjected to the clockwise rotation of 45° about the origin and then translation in the direction of vector (1, 0).

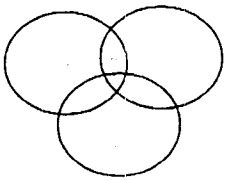
15. Reflect the diamond-shaped polygon whose vertices are A (–1, 0), B(0, –2), C(1, 0) and D(2, 2) about (a) the horizontal line y=2, (b) the vertical line x=2, and (c) the line y=x+2.

16. A square ABCD is given with vertices A(0, 0), B(1, 0), C(1, 1), and D(0, 1). Illustrate the effect of a) x-shear b) y-shear c) xy-shear c) xy-shear on the given square, when a=2 and b=3.

Multimedia Lab

Answer any *one* question 40

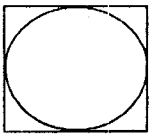
17. Draw the following figure using mid-point circle drawing algorithm :



18. Write a program to draw a Bazier Curve having 4 control points.

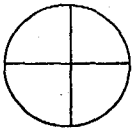
19. Write a program to implement mid-point ellipse drawing algorithm.

20. Write a program to draw the following figure without using any inbuilt function :



21. Write a program to draw a B-Spline curve having 4 control points.

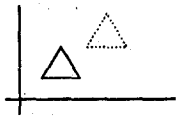
22. Write a program to draw the following figure using any standard algorithm :



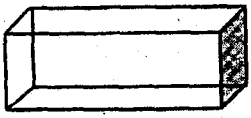
23. Write a program to draw a Bazier curve with 3 control points.

24. Write a program to display first letter of your name using line drawing algorithm.

25. Write program to perform translation of a triangle object as below. Here the translation factors t_x and t_y are user input. The end-points of the triangle are also user input.



26. Write a program to draw the object as shown below.



PNB — 05

Viva — 05