2012

M.Sc.

1st Semester Examination

COMPUTER SCIENCE

PAPER—COS–105

(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.

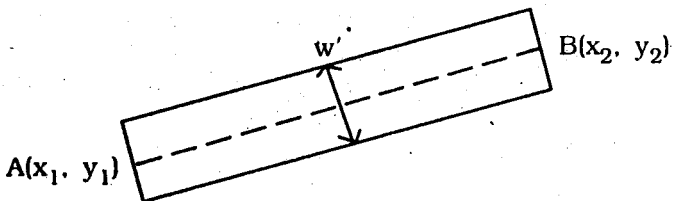*All notations have their usual meaning.*

Computer Graphics Lab

[Marks—25]

Answer any *one* (on lottery basis)   15

1. Write a program to draw a thick line from point $A(x_1, y_1)$ to point $B(x_2, y_2)$ of thickness 'w'' pixels.
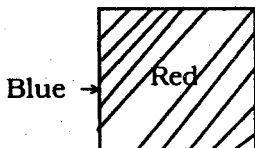
2. Write a program to display the first character of your name using any standard line drawing algorithm. 15

3. Write a program to find the final transformation matrix of a triangle after the following 2D transformation :

   (i) 90° rotation about origin ;

   (ii) reflection about line $y = -x$.

   (The value of co-ordinates of the triangle should be defined by the programmers).

4. Write a menu driven program that will do the following :

   (i) Scaling of a triangle with $sx = 3$ and $sy = 5$.

   (ii) X-direction shear of a square with $sh_x = 2$.

   (iii) Rotation of a polygon about an angle θ with respect to an arbitrary point, where $\theta = 45°$.

   (iv) Default will display a message and will return back to the menu.

5. Write a program to draw a polygon of 4 vertices A(20, 10), B(60, 10), C(60, 30), D(20, 30). Find the transformation matrix that will double the size of the polygon with point A located at the same place. 15

6. Write a program to implement Cohen-Sutherland line clipping algorithm. 15

7. Write a program to show that a 2D reflection through X-axis followed by a 2D reflection through the line $y = -x$ is equivalent to the rotation about an origion by an angle $\theta = 270°$.

8. "The reflection along the line y = x is equivalent to the reflection along the x axis followed by counter clockwise rotation by 90° degree". Write a program to justify the above statement.

9. Write a program to fill the following area using any standard filling algorithm.

Blue →   Red

10. Write a program to display the following stepwise : 15
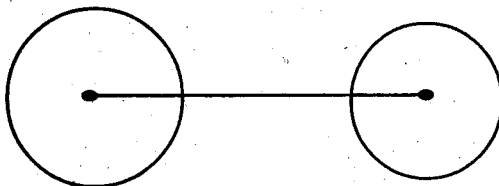

With Center = (50, 60)

Step 1 :
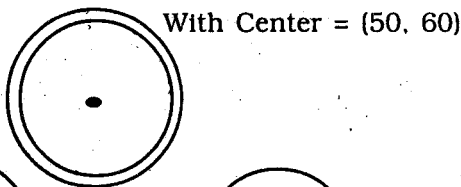
Step 2 :

With translation vector tx = 2 = ty

Step 3 :

All the output primitive objects should be drawn using standard algorithms.

11. Fill a rectangle using flood fill algorithm.   15

12. Clip a line using Cohen-Sutherland algorithm.   15

13. Given a set of four control points $P_1(6, 8)$, $P_2(11, 4)$, $P_3(10, 8)$ and $P_4(5, 5)$.

    Draw a Cupic Bezer Curve using the four given control points.   15

(PNB + Viva — 10 marks)

Microprocessor Lab
[Marks—25]

Answer any *one* (on lottery basis)   15

1. Write an assembly language program for division of two bytes number. (8086)

2. Write an assembly language program for addition of two words packed BCD number. (8086)

3. Write an assembly language program for ascending order sorting. (8086)

4. Write an assembly language program for factorial of a given byte number. (8086)

5. Write an assembly language program to print the first ten Fibonacci number. (8086)

6. Write an assembly language program for packed to unpacked of two digit BCD number. (8086)

7. Write an assembly language program for multiplication of two words number. (8086)

8. Write an assembly language program for character sorting (Z — A). (8086)

(PNB + Viva — 10 marks)