Question 2:

PAC Chart:

DATA GIVEN	REQUIRED RESULT(S)
• x-Coordinate of the point. • y-Coordinate of the point.	• The quadrant in which the point lies.
REQUIRED PROCESSING	**SOLUTION ALTERNATIVE(S)**
• Check the sign of the x-coordinate. • Check the sign of the y-coordinate. • Use the signs of the coordinates to figure out the quadrant: • In Quadrant I, both x and y are positive. • In Quadrant II, x is negative, and y is positive. • In Quadrant III, both x and y are negative. • In Quadrant IV, x is positive, and y is negative.	• If either coordinate is 0, the point lies on an axis rather than in a quadrant.

IPO Chart:

INPUT	PROCESS	MODULE REF	OUTPUT

• x-Coordinate
• y-Coordinate
	• Read the value for the x-coordinate.
	• Read the value for the y-coordinate.
	• Use conditional statements to determine the location based on the signs of x and y.
	• If both x and y are positive, the location is Quadrant 1.
	• If x is positive and y is negative, the location is Quadrant 4.
	• If x is negative and y is positive, the location is Quadrant 2.
	• If both x and y are negative, the location is Quadrant 3.
	• Otherwise, if either coordinate is zero, the location is on an Axis.
		INPUT
		
		COMPUTE
		
		IF-THEN
		
		IF THEN
		
		IF-THEN
		
		IF-THEN
		
		ELSE
			The quadrant (Q1, Q2, Q3, Q4) or "Axes"

Algorithm:

1. Prompt the user to input the x and y coordinates of a point.
2. Assign the entered values to distinct variables.
3. Evaluate if the x and y coordinates are both positive (greater than 0).
4. If they are, display "Quadrant I."
5. Otherwise, check if the x-coordinate is positive (greater than 0) and the y-coordinate is negative (less than 0).
6. If this condition is met, display "Quadrant IV."
7. Otherwise, check if the x-coordinate is negative (less than 0) and the y-coordinate is positive (greater than 0).
8. If this condition is true, display "Quadrant II."
9. Otherwise, check if both the x and y coordinates are negative (less than 0).
10. If this is the case, display "Quadrant III."
11. Finally, if none of the above conditions are satisfied, display "Point lies on an Axis."

Pseudo Code:

1. START
2. DISPLAY "Coordinates are entered in the format (x,y)."
3. DISPLAY "Please enter the x-coordinate:"
4. GET x
5. DISPLAY "Please enter the y-coordinate:"
6. GET y
7. IF x > 0 AND y > 0 THEN

- PRINT "The point is located in Quadrant I"

8. ELSE IF x > 0 AND y < 0 THEN

- PRINT "The point is located in Quadrant IV"

9. ELSE IF x < 0 AND y > 0 THEN

- PRINT "The point is located in Quadrant II"

10. ELSE IF x < 0 AND y < 0 THEN

- PRINT "The point is located in Quadrant III"

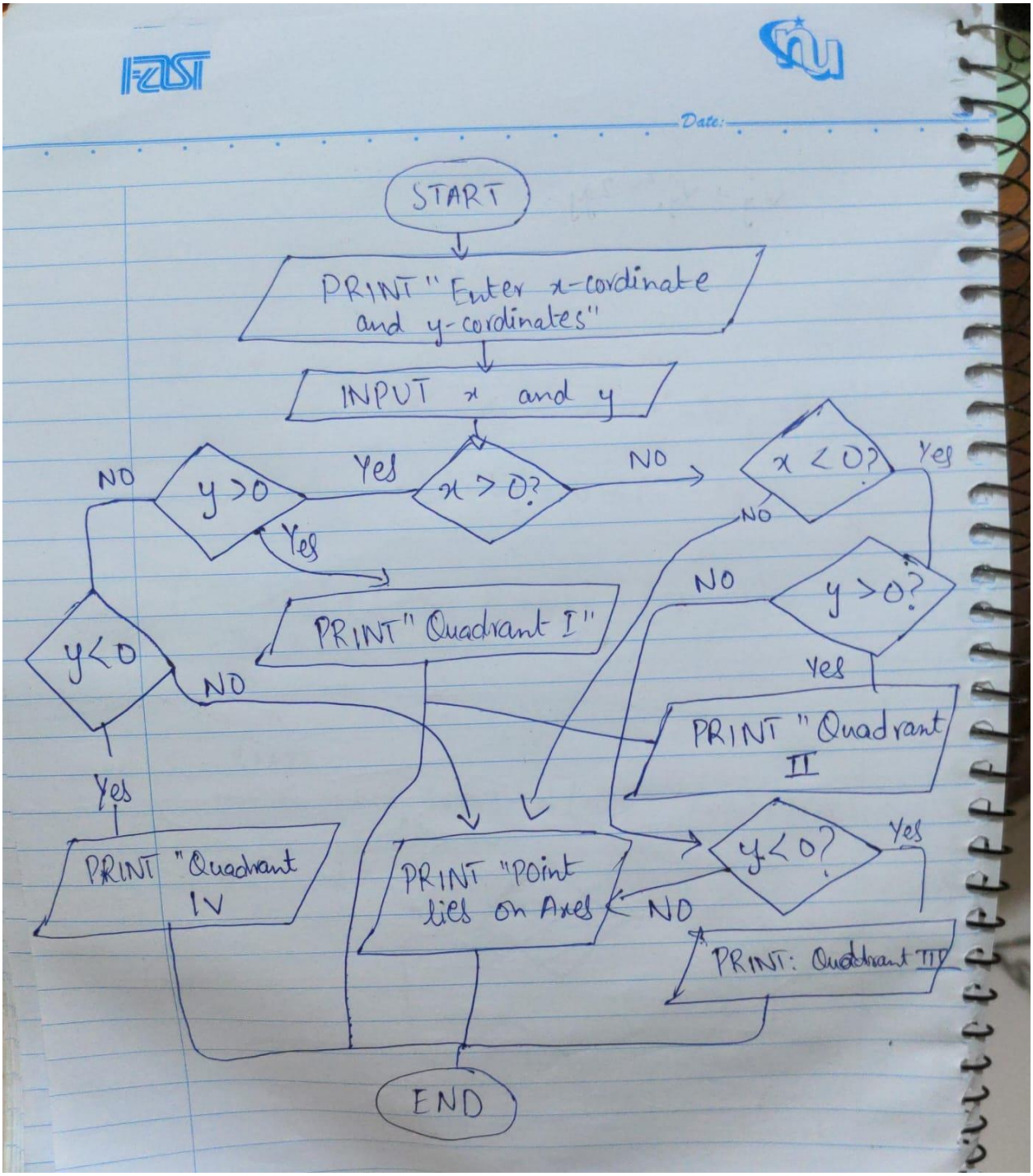
11. ELSE

- PRINT "The point is located on an Axis"

ENDIF

12. END

Flowchart:


START
PRINT "Enter x-cordinate and y-cordinates"
INPUT x and y
x > 0?
Yes
NO
y > 0
NO
Yes
PRINT "Quadrant I"
y < 0
NO
Yes
PRINT "Quadrant IV
x < 0?
Yes
NO
y > 0?
NO
Yes
PRINT "Quadrant II
y < 0?
Yes
NO
PRINT "Point lies on Axes
PRINT: Quadrant III
END