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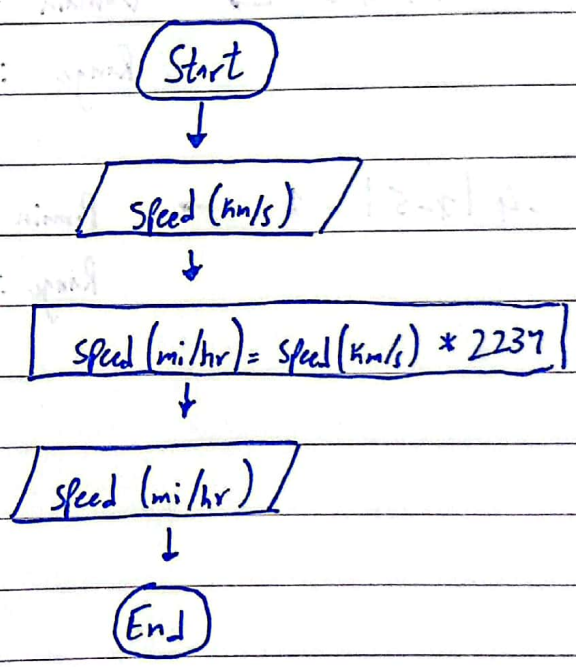
PF Theory Olympics

Q.1. IPO.

Input	Processing	output
speed in Km/s	convert Km/s to mi/hr	speed in mi/hr

Q Pseudocode.

Start
INPUT Speed_Km/s
REM
Speed_mi/hr = (Speed_Km/s * 2237)
PRINT Speed_mi/hr
END



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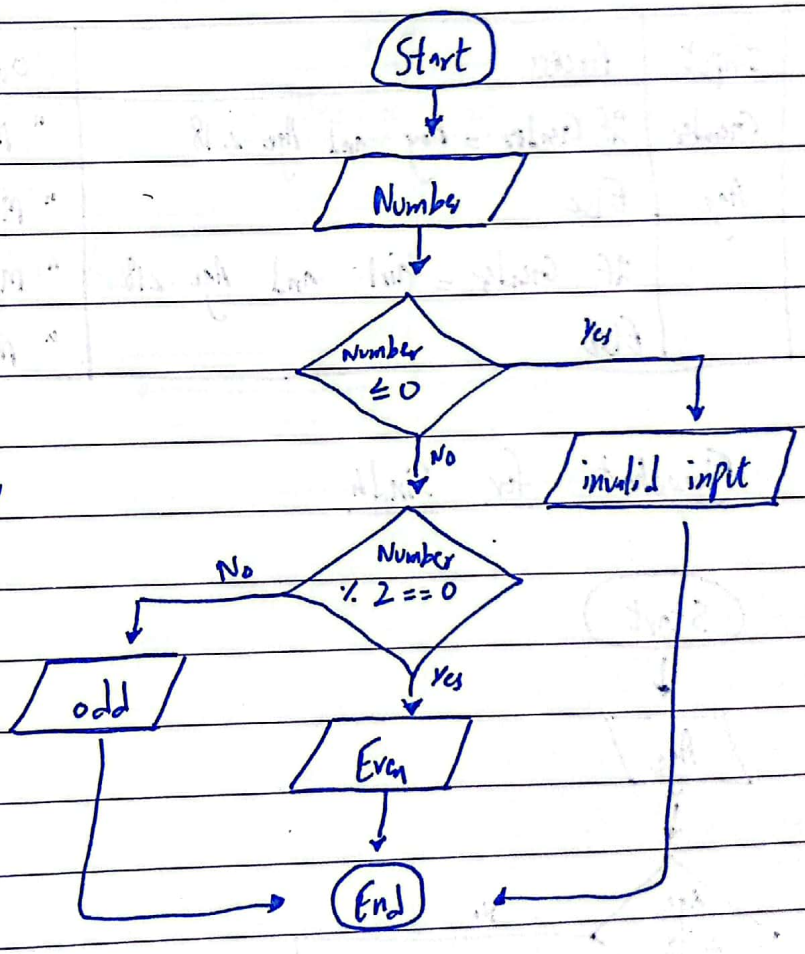
Q.2. IPO

Input	Process	output
Number	If Number ≤ 0	Invalid input
	If Number >0, check for even or odd	
	If Number % 2 != 0	Odd
	If Number % 2 == 0	Even

Psuedocode.

```
START
INPUT Number
IF Number <= 0 THEN
    Output "Invalid Input"
ELSE
    IF Number % 2 == 0 THEN
        Output "Even"
    ELSE
        output "odd"
    END IF
END IF
END
```



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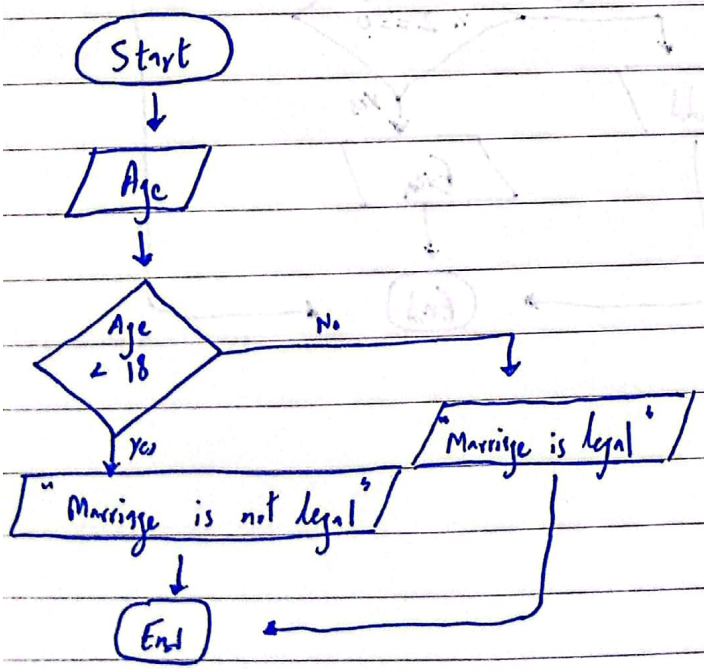
2.3. IPO For Sindh

Input	Process	Output
Age	If Age < 18	"Marriage is not legal"
	If Age >= 18	"Marriage is legal"

IPO For Punjab & other Provinces

Input	Process	Output
Gender	If Gender = Boy and Age < 18	"Marriage is not legal"
Age	Else	"Marriage is legal"
	If Gender = Girl and Age < 18	"Marriage is not legal
	Else	"Marriage is legal

Flowchart for Sindh



Pseudocode

```
START
Input Age
IF Age < 18
PRINT "Marriage is not legal"
ELSE
PRINT "Marriage is legal"
END
```

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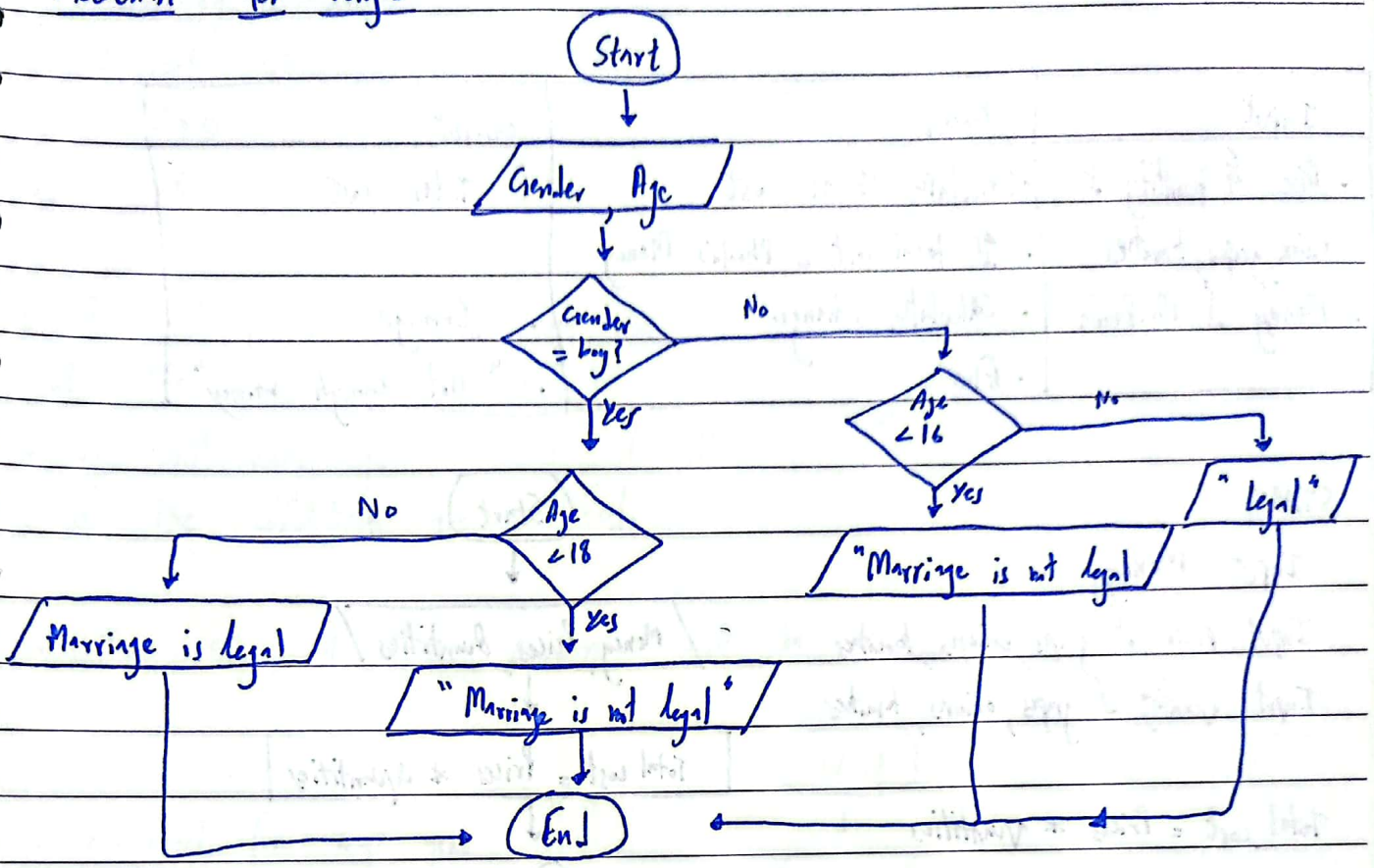
Flowchart for Punjab



Pseudocode.

```
START
    Input Gender
    Input Age
    IF Gender = boy and Age < 18 THEN
        PRINT " Marriage is not legal"
ELSE IF Gender = girl and Age < 16 THEN
        PRINT " Marriage is not legal"
ELSE
        PRINT " Marriage is legal"
END
```

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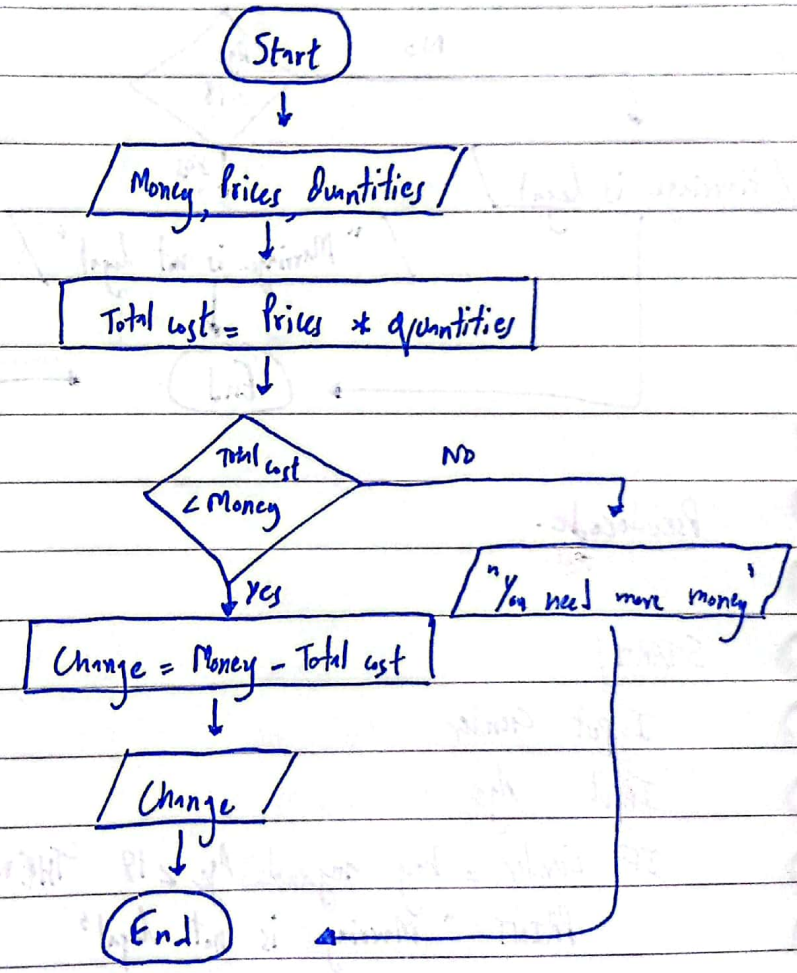
Q.4. IPO

Input	Process	output
• Prices & quantity of onion, grapes, tomatoes • Money of Mr. Bhola	• Calculate Total cost • If total cost < Bhola's Money • Calculate change • Else	• Total cost • Change • "Not enough money"

```
START
  Input Money
  Input price of grapes, onions, tomatoes
  Input quantity of grapes, onions, tomatoes

  Total_cost = Prices * quantities

  IF Total_cost < Money THEN
    change = Money - Total_cost
    output change
  ELSE
    output "You need more money"
  END IF
END
```



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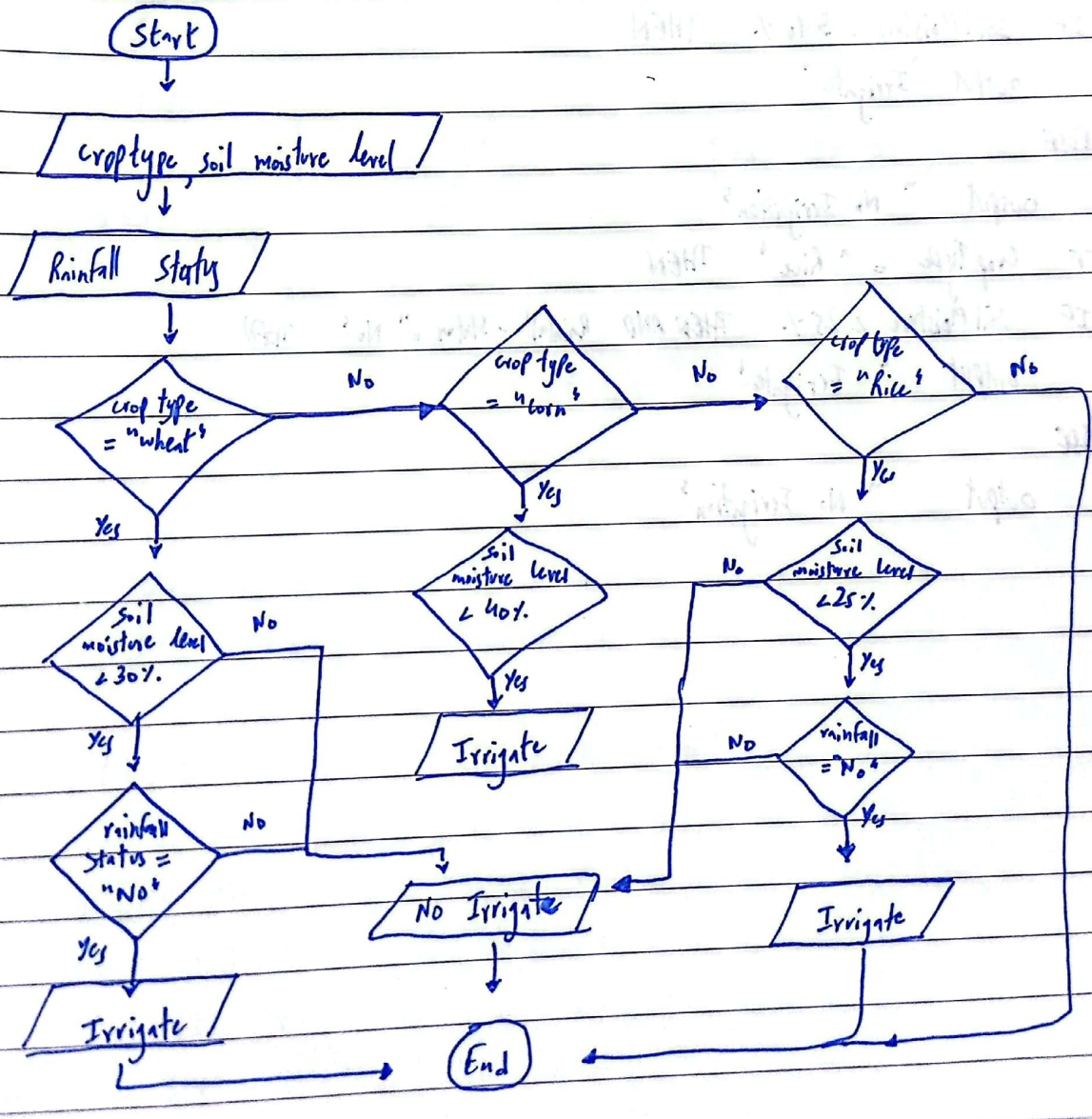
Problem D.S.

Problem Limitations	input	Process	output
	• Croptype • moisture level • Rainfall status	• Check the crop • Check if the crop level matches the croptype • Check if there is rainfall in last 24 hours	Irrigation statys

Flowchart



Date:

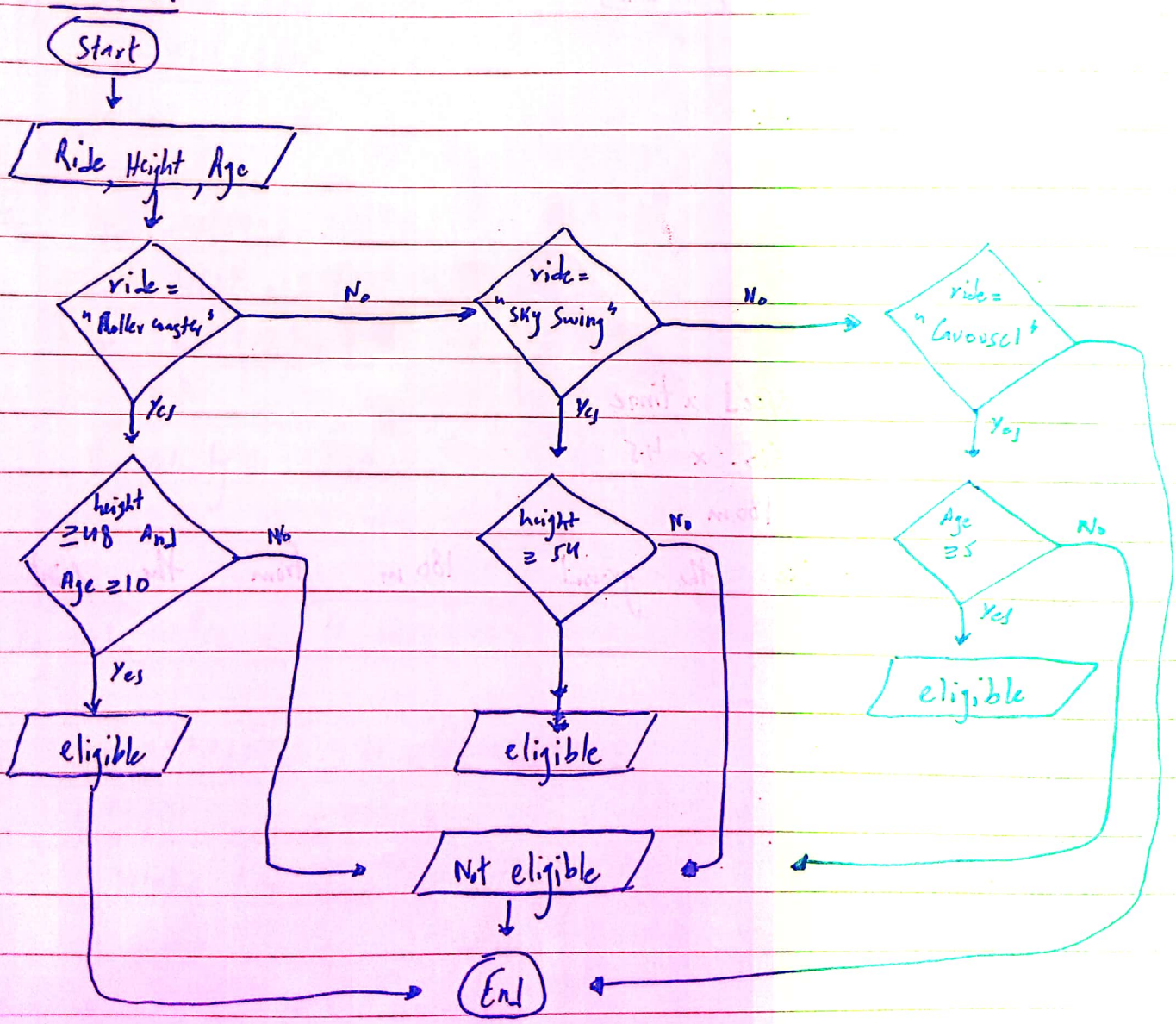
Pseudocode.

```
Start
Input CropType, SoilMoisture, RainfallStatus
IF CropType = "Wheat" THEN
    IF SoilMoisture < 30% AND RainfallStatus = "No" THEN
        output "Irrigate"
    ELSE
        output "No Irrigation"
ELSE IF CropType = "Corn" THEN
    IF SoilMoisture < 34% THEN
        output "Irrigate"
    ELSE
        output "No Irrigation"
ELSE IF CropType = "Rice" THEN
    IF SoilMoisture < 25% THEN AND RainfallStatus = "No" THEN
        output "Irrigate"
    ELSE
        output "No Irrigation"
END
```

d.c. IBO

input	Process	output
Ride Height Age	Check & compare the height and Age with specific Ride If the visitor matches with eligible else	"eligible for ride" "not eligible"

Flow chart



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Pseudocode

```
Start
  Input Ride, Height, Age
  IF Ride = "Dragon Roller Coaster" THEN
      IF Height >= 48 AND Age >= 10 THEN
          output "eligible"
      ELSE
          output "Not eligible"
  ELSE IF RIDE = "Sky Swing" THEN
      IF Height >= 54 THEN
          output "eligible"
      ELSE
          output "not eligible"
  ELSE IF Ride = "Carousel" THEN
      IF Age >= 5 THEN
          output "eligible"
      ELSE
          output "Not eligible"
END
```

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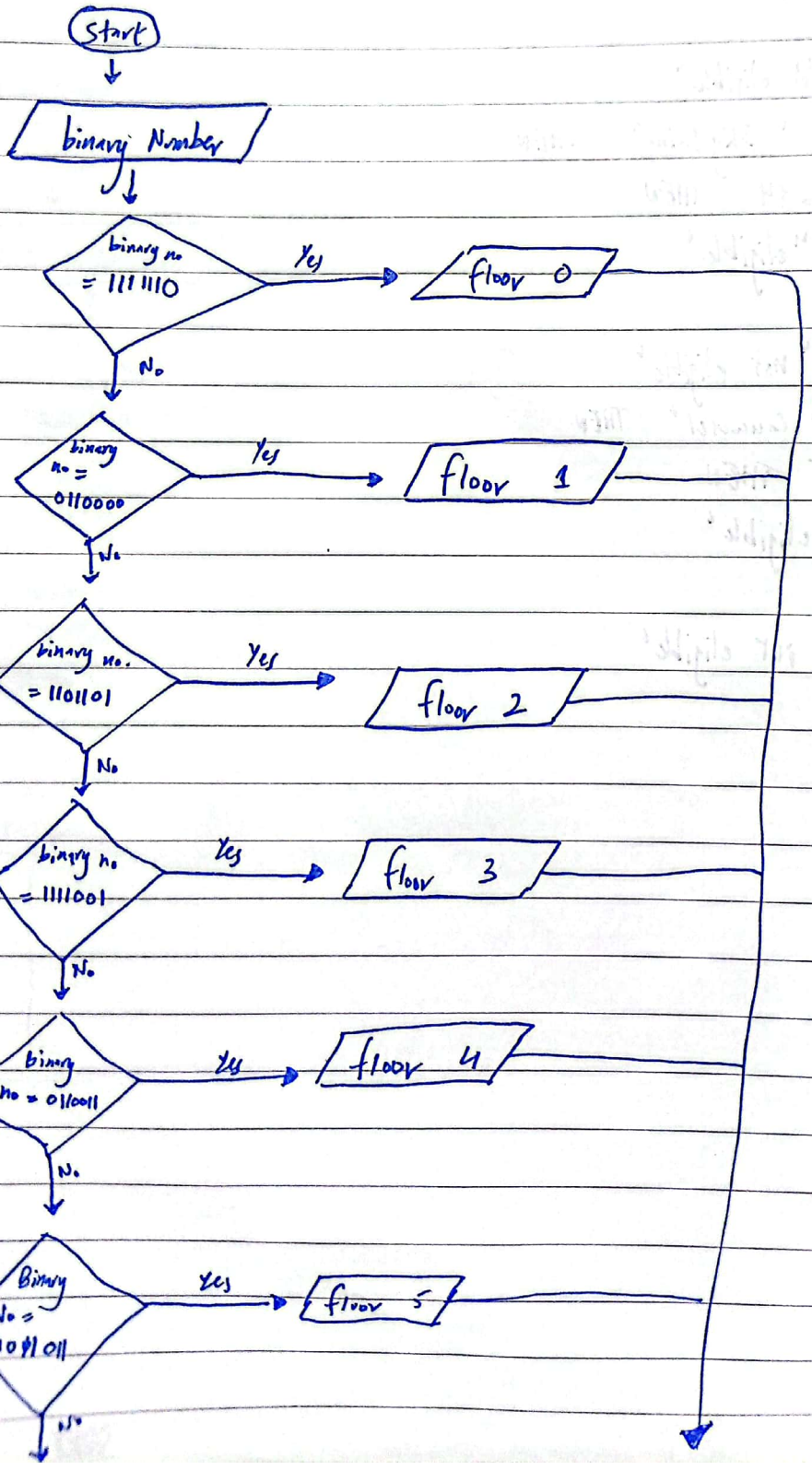
8.7. IPO

Input	Process	oUtput
A binary Number	Compare the binary Number with each segment pattern	output the floor

Flowchart



COPY

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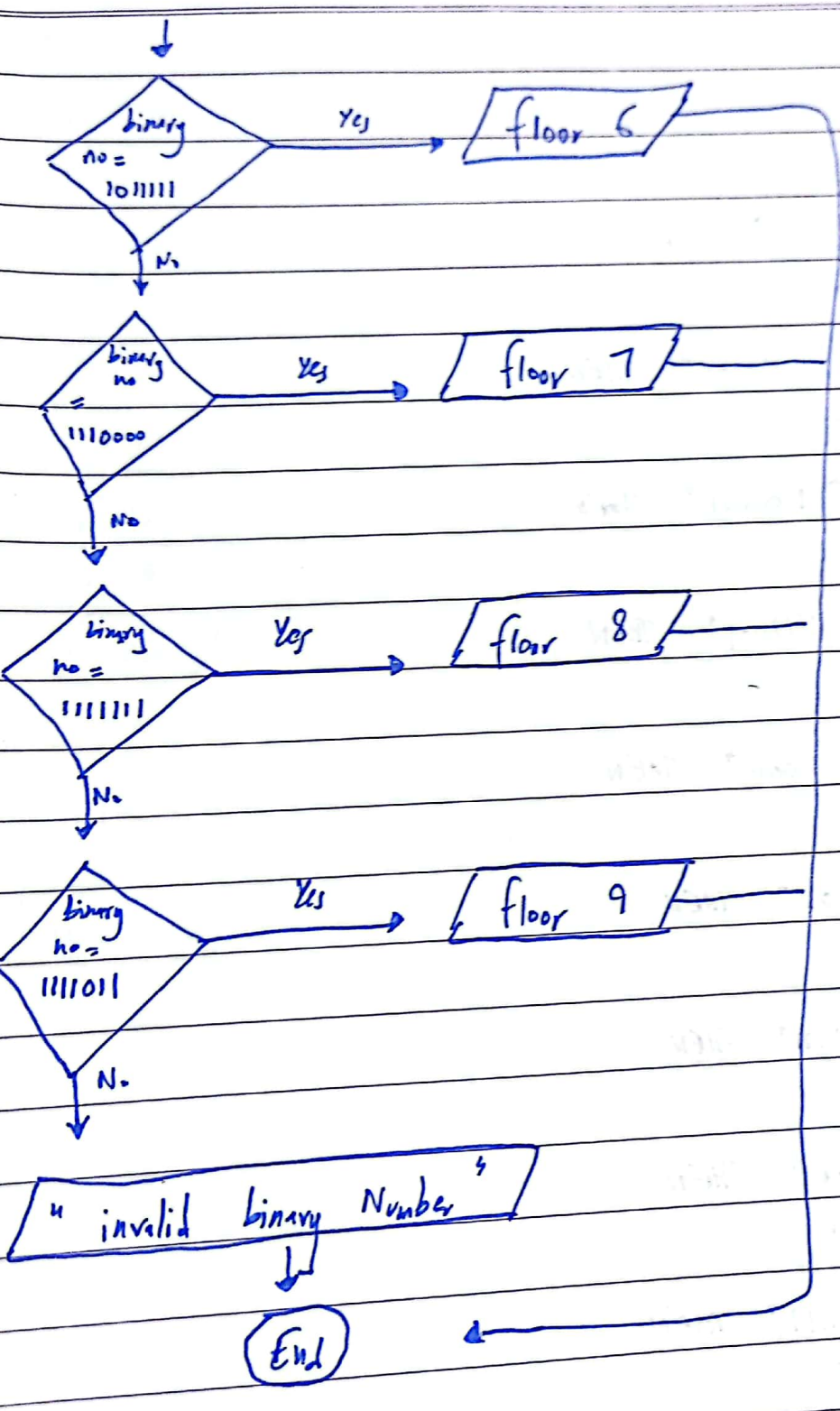

Pseudocode

```
START
    Input binary_no
    IF binary_no == "1111110" THEN
        output "floor 0"
    ELSE IF binary_no == "0110000" THEN
        output "floor 1"
    ELSE IF binary_no == "1101101" THEN
        output "floor 2"
    ELSE IF binary_no == "1111001" THEN
        output "floor 3"
    ELSE IF binary_no == "0110011" THEN
        output "floor 4"
    ELSE IF binary_no == "1011011" THEN
        output "floor 5"
    ELSE IF binary_no == "1011111" THEN
        output "floor 6"
    ELSE IF binary_no == "1110000" THEN
        output = "floor 7"
    ELSE IF binary_no == "1111111" THEN
        output "floor 8"
    ELSE IF binary_no == "1111011" THEN
        output "floor 9"
    ELSE
        output "invalid binary number"
END
```

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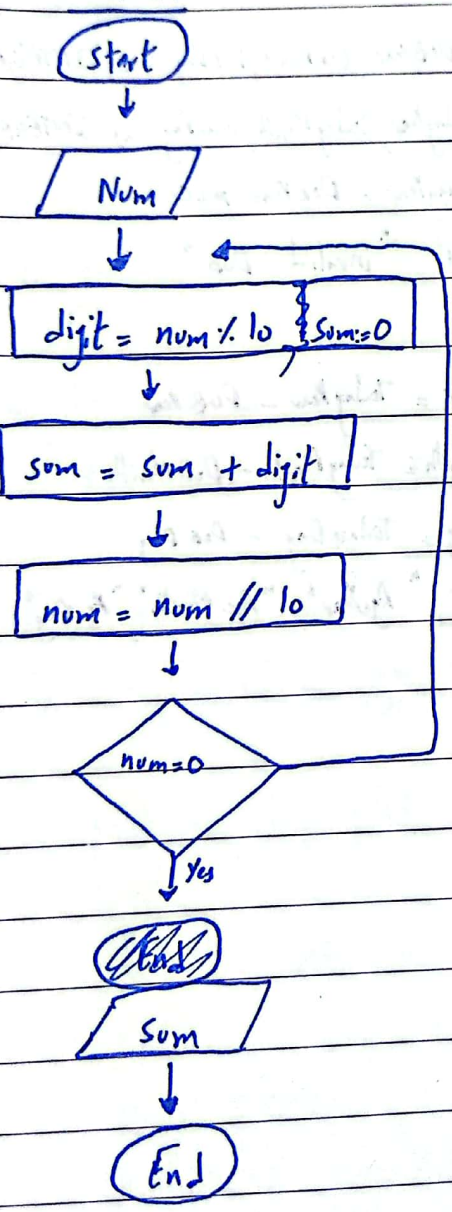
d.6. IPO

input	Process	output
num	individually extract each digit from number and Add & store in Sum	Sum

Flowchart



Pseudocode

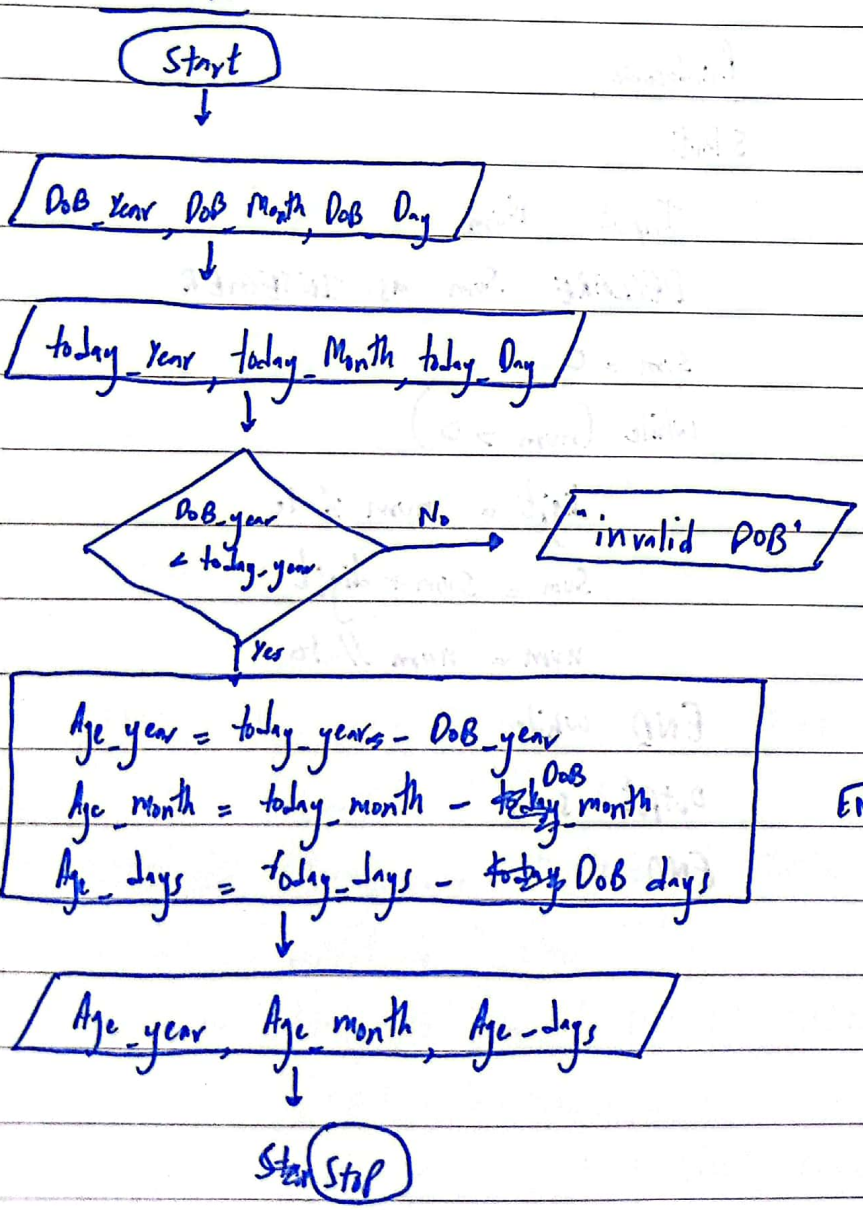
```
Start
  Input Num
  DECLARE Sum as INTEGER
  Sum = 0
  while (num > 0)
      digit = num % 10
      Sum = Sum + digit
      num = num // 10
  END while
  Output sum
END
```

Date:

IPO

d.s.	Input	Process	output
	input	Calculate the difference in year, month, days	Age_year
	DoB	Check if the year < 2024, 4months < 3 & 12,	Age_Month
	today's date	days < 31	Age_days

Flowchart



Pseudocode

```
Start
  Input DoBYear, DoBMonth, DoBDay as INTEGER
  Input TodayYear, TodayMonth, TodayDay as INTEGER
  IF TodayYear - DoBYear >=0
    output "invalid DOB"
  ELSE
    AgeYear = TodayYear - DoBYear
    AgeMonth = TodayMonth - DoBMonth
    AgeDay = TodayDay - DoBDay
    output "AgeYear", "AgeMonth", "AgeDay".
END
```

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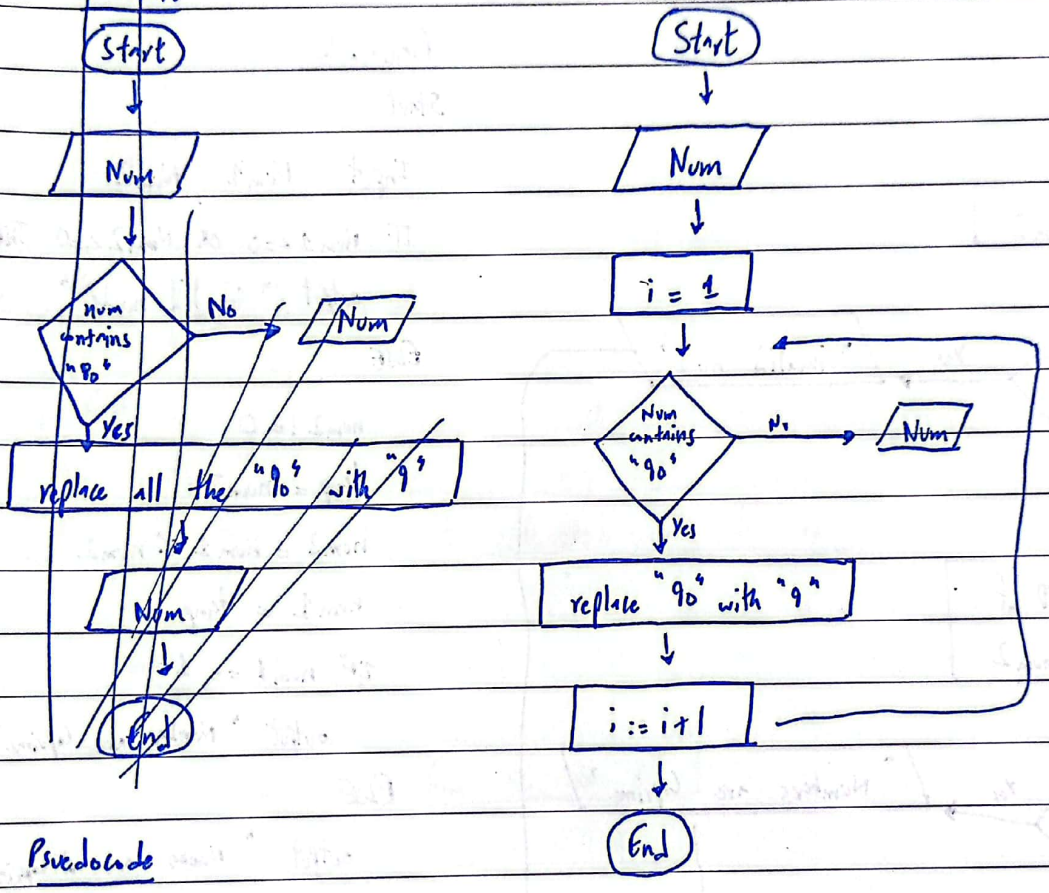
2.10. IPO

input	Process	output
Num	Check if it contains 90 And replace 90 with 9	Number

Flowchart



Psuedocode

```
Start
    Input   Num as String
    DECLARE correct_Num as INTEGER
    For  i:=i  to length(num)
        IF  num[i] == "9" THEN
            delete  num[i+1]
        i = i + 1
    correct_num = num
    output  correct_num
END
```

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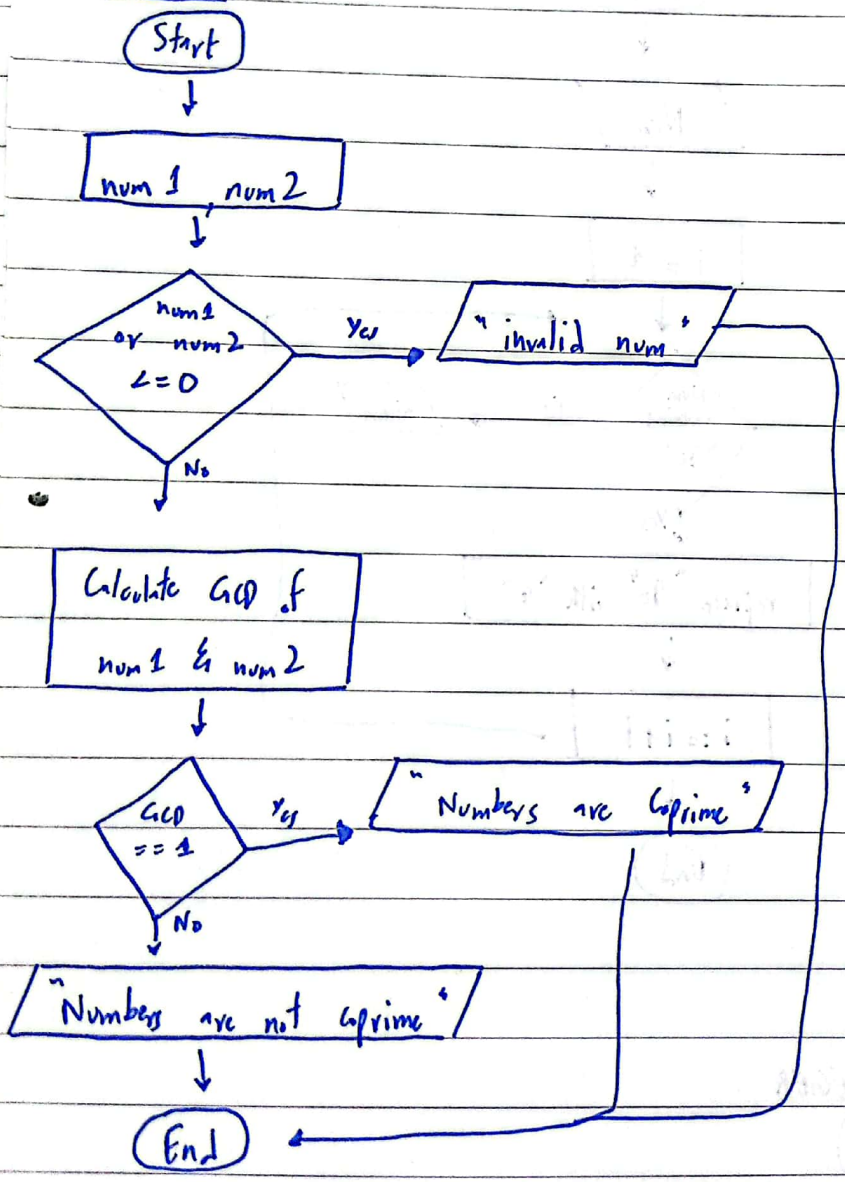
d.ii. IPO

input	Process	Output
num1	Calculate GCD of num1 & num2	
num2	If GCD = 1	"Coprime"
	ELSE	"Not Coprime"

Flowchart.



Pseudocode

```
Start
  Input Num1, Num2
  IF Num1 <=0 OR Num2 <=0 THEN
    output "invalid number"
  ELSE
    num2 != 0
    temp = num2
    num2 = num1 % num2
    num1 = temp
    IF num1 == 1
      output "Number are Coprime"
    ELSE
      output "Number are not Coprime"
    END IF
END
```

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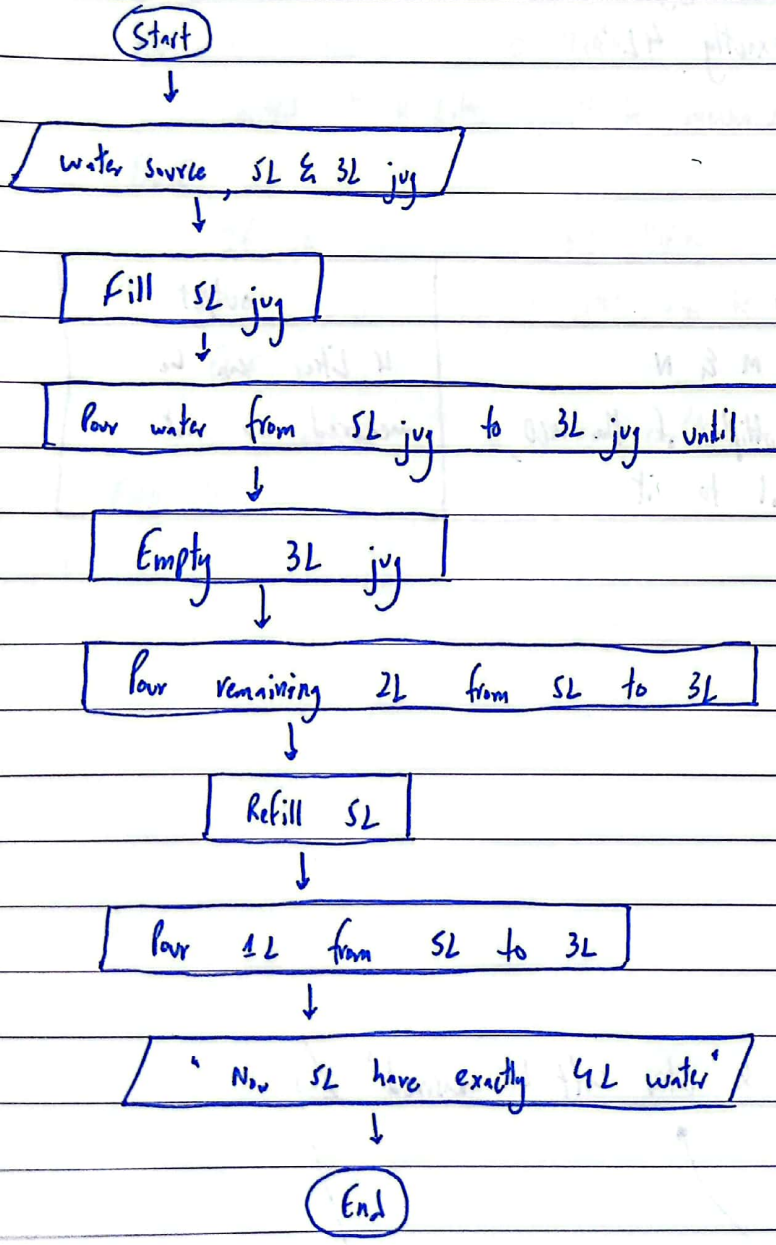
d.12. IPO

input	Process	output
water source 5L and 3L jug	1. Fill 5L jug & pour it in 3L jug until is full 2. Empty 3L jug, pour remaining water of 5L jug into 3L jug 3. Refill 5L jug & pour in 3L jug untill it is full	4L water in 5L jug

Flowchart



Pseudocode

Start

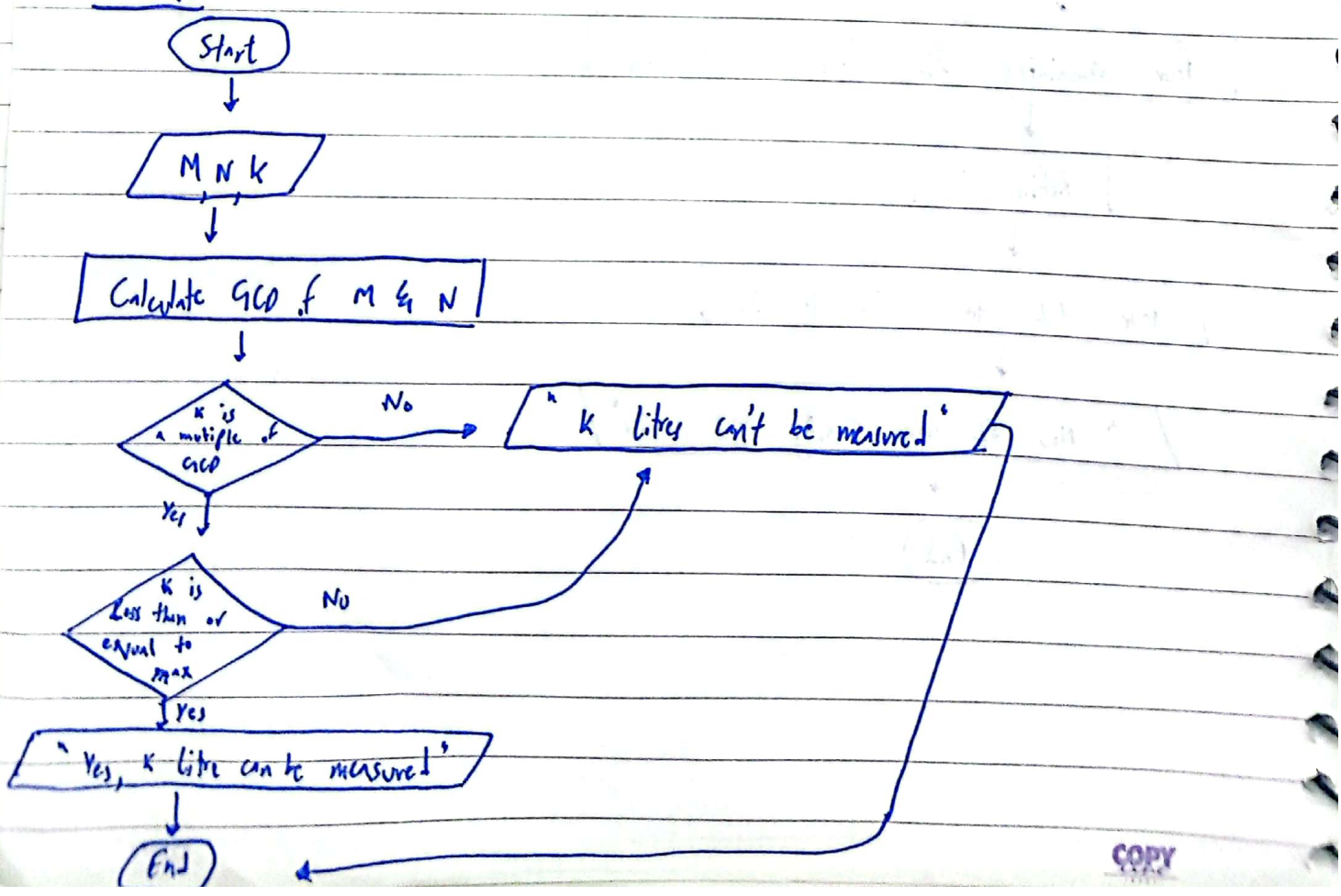
Fill 5L jug
Pour 5L into 3L until 3L is full
Empty 3L jug
Pour remaining 2L from 5L into 3L
Fill 5L jug again
Pour 1L from 5L into 3L jug
output "5L jug contains exactly 4L"

END

Q.13. IPO

input	Process	output
M, N, K	. Calculate GCD of M & N . If K is a multiple of the GCD, or less or equal to it	K Litres can be measured or not

Flow chart



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Pseudocode

```
Start
    Input  M, N, K
    While  N != 0
    temp = N
    N = M % N
    M = temp
    GCD_value = M
    IF  K % GCD_value != 0  THEN
        output " K Litres can't be measured "
    ELSE
        If  K <= max (M, N)  THEN
            output " Yes, K litres can be measured "
        ELSE
            output " K litres can't be measured "
    END IF
END
```