PF - Theory . Assignment # 1

Part 1

Question No. 1

1. Analysis :

PAC

Given Data	Required Results
1. daily limit 2. transactions 3. location of transaction 4. Hours spent 5. total transaction amount	Suspicious transactions (unusual)
Processing Required	**Solution Alternative**

if (total > daily limit) then
show "Suspicious --"
 	
if (location = False)
or if (location ≠ True) then
show "Suspicious --"
 	
if (hour 1 = hour 2 &&
hour 1 = hour 3 ||
hour 1 = hour 2 ||
hour 2 = hour 3 ||
hour 1 = hour 3) then
 	
show "Suspicious: Too many transactions."
	Use loops } not taught yet
	Use arrays } not taught yet

IPO

Input	Processing	Output

- daily limit
- transactions
- location of transaction
- Hours spent
- total (transaction)
	if (total > daily limit) then show "suspicious..."
	if (location (all) = False (F)) then show "suspicious.."
	if (h1=h2 && h1=h3 || h1=h2 || h2=h3 || h1=h3) then show "suspicious: Too many transactions"
		Suspicious (unusual) transactions

2. Designing :

Algorithm :

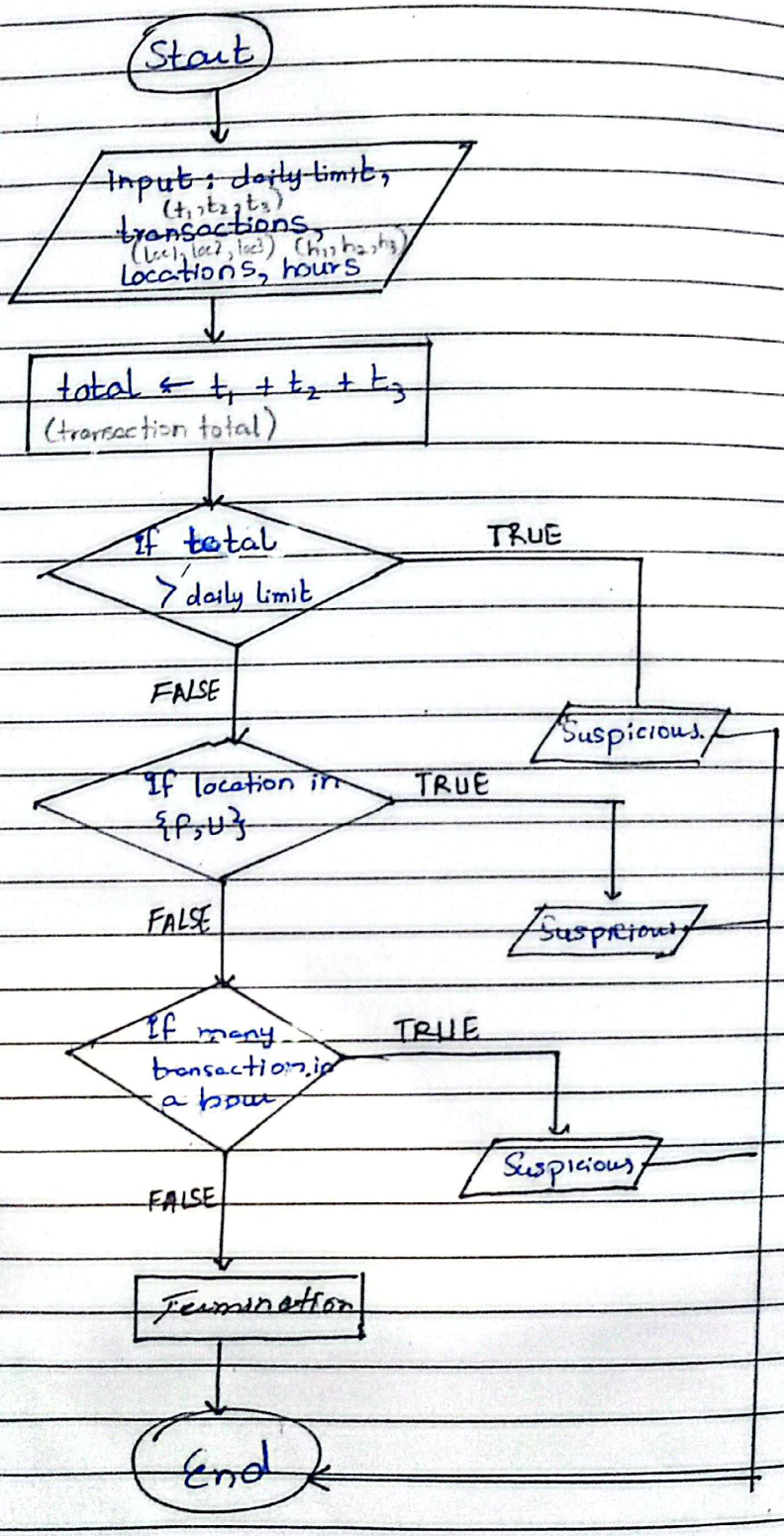
1. START
2. Set daily limit = 5000
3. Input 3 transaction amounts, their locations, and hours.
4. Calculate total $\leftarrow t_1 + t_2 + t_3$ (of transactions)
5. If total > daily limit $\longrightarrow$ print "Suspicious..."
6. If ~~total~~ any location is not Pakistan or UAE $\longrightarrow$ print "suspicious"
7. If all 3 transactions occur in the same hour $\longrightarrow$ print "Suspicious..."
8. STOP

Pseudocode:

```
BEGIN

    daily_limit ← 5000
    READ t1, loc1, h1
    READ t2, loc2, h2
    READ t3, loc3, h3

    total ← t1 + t2 + t3

    IF (total > daily_limit) THEN
        PRINT "Suspicious: Daily spending exceeded"
    END IF

    IF (loc1 not in {P,U} OR loc2 not in {P,U} OR loc3 not
        in {P,U}) THEN
        PRINT "Suspicious: Unusual country!"
    END IF

    IF (h1 = h2 AND h1 = h3) THEN
        PRINT "Suspicious: Too many transactions in short time!"
    END IF

STOP
```

Date: _____ Day: _____

Flowchart : (Question 1)



Point ——→ which Quadrant ?

Question no. 2

1. Analysis :

PAC

Given Data	Required Results
Point (coordinate) x Point (coordinate) y	Quadrant of point
Processing Required	**Solution Alternative**
(using if-else) if $x>0$ and $y>0$, Q-I if $x<0$ and $y>0$, Q-II if $x<0$ and $y<0$, Q-III if $x>0$ and $y<0$, Q-IV Not Compulsory { if $x=0$ or $y=0$, on axis if $x=0$ and $y=0$, at origin	(Switch case)

IPO

Input	Processing	Output
Point x, y	1. Input x, y 2. If $x>0$ and $y>0$ then show Quadrant-I If $x<0$ and $y>0$ then show Quadrant-II If $x<0$ and $y<0$ then show Quadrant-III If $x>0$ and $y<0$ then show Quadrant-IV	Quadrant of point

if $x=0$ and $y=0$ then
on Origin

If $x=0$ then
show on y-axis

If $y=0$ then
show on x-axis

3. Print the quadrant of point.

2. Designing:

Algorithm:

1. START

2. Input point x and y representing the coordinates.
3. Check if ($x \geq 0$ and $y > 0$) then
   The point lies in quadrant-I
   if ($x < 0$ and $y > 0$) then
   The point lies in quadrant-II
   if ($x < 0$ and $y < 0$) then
   The point lies in quadrant-III
   if ($x > 0$ and $y < 0$) then
   The point lies in quadrant-IV
   if ($x = 0$) then
   The point lies on y-axis
   if ($y = 0$) then
   The point lies on x-axis
   if ($x = 0$ and $y = 0$) then
   The point lies on origin

4. Print " The point (x, y) lies in quadrant "

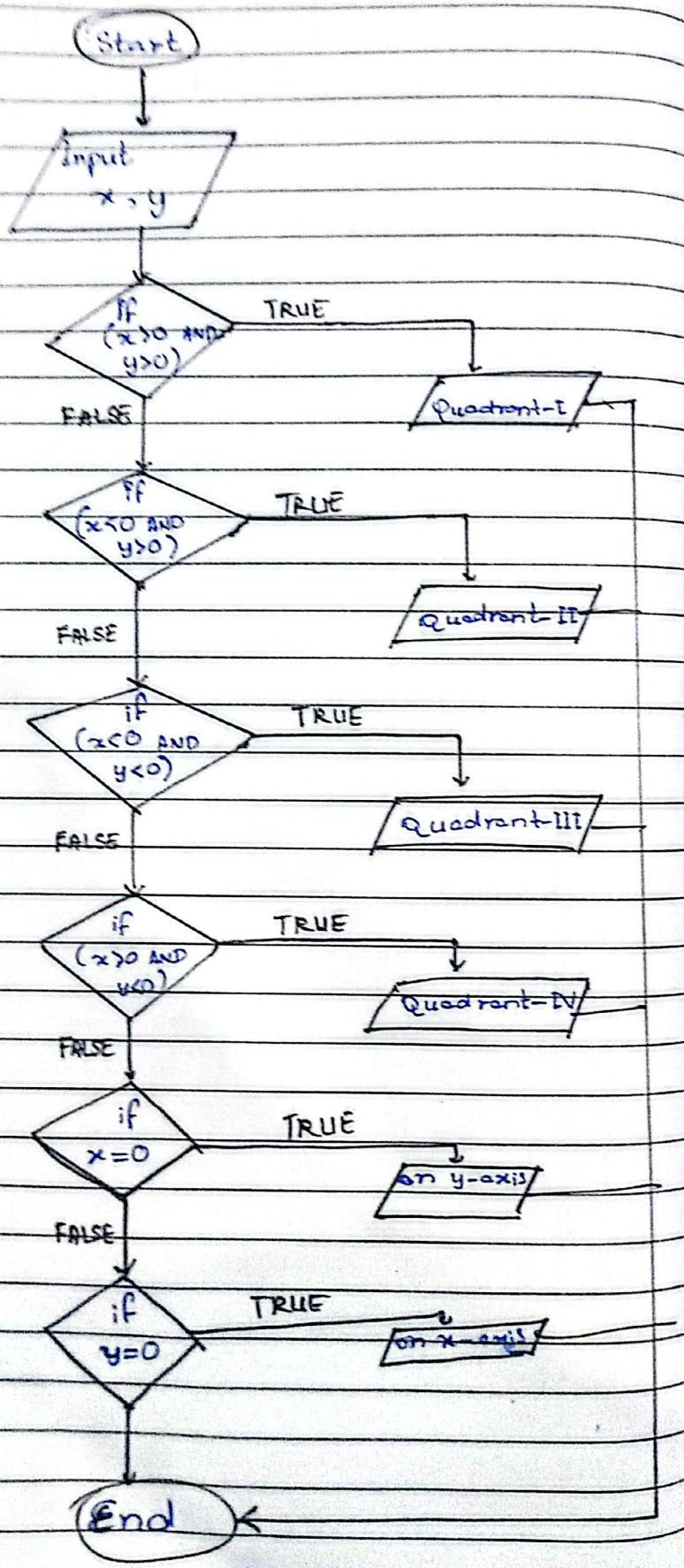
5. END

Pseudocode :

```
BEGIN

INPUT x
INPUT y

IF (x>0 and y>0) THEN
    PRINT " The point is at quadrant-I "
ELSE IF (x<0 and y>0)
    PRINT " The point is at quadrant-II "
ELSE IF (x<0 and y<0)
    PRINT " The point is at quadrant-III "
ELSE IF( x>0 and y<0)
    PRINT " The point is at quadrant-IV "
ELSE IF (x=0)
    PRINT " The point is on y-axis "
ELSE IF (y=0)
    PRINT " The point is on x-axis "
ELSE IF (x=0 and y=0)
    PRINT " The point is at origin "
END IF

PRINT " The point(x,y) lies in Quadrant ", quadrant

END
```

Date: Day:

Flowchart: (question 2)



Teacher Signature

Question no. 3

1. Analysis :

PAC

Given Data	Required Result
• age (of applicant) • Eyesight exam result • Written test result • Driving test result • Medical certificate (only if (age >60))	Driving license (eligibility or not)
Processing Required (Not actual code)	**Solution Alternative**

if (age < 18), then show "You are ineligible".
if (eyesight = 'F') then show "You are not eligible"
if (written = 'F') then show "Retake the written test"
if (driving = 'F') then show "You are not eligible"
if (age ≤ 60) then show "You are eligible for a driving license".
otherwise: ask for medical certificate
if (medical = 'Y') then show "You are eligible"
otherwise show "You are ineligible"
	Switch case

IPO

Input	Process	Output
		(Driving license Eligibility or not)
• age (of applicant)	1. Input age	
• eyesight result	2. Input eyesight result	"You are eligible for driving license."
• written result	3. Input written result	
• driving result	4. Input driving result	or
• medical certificate	5. Input medical certificate	"You are not eligible for driving license."
	6. if (age <18) then show "You are not eligible"	
	if (eyesight result = 'F') then show "You are not eligible"	
	if (written result = 'F') then show "Retake the written test"	
	if (driving result = 'F') then show "You are not eligible"	
	if (age <= 60) then show "You are eligible";	
	If otherwise ask for medical certificate	
	if (medical = 'Y') then Print "You are eligible for driving license"	
	otherwise Print "You are not eligible for driving license".	

2. Designing:

Algorithm:

1. START

2. Input age of the applicant
3. Input eyesight result of the applicant
4. Input written result of the applicant
5. Input driving result of the applicant
6. Input medical certificate of the applicant

7. Check if (age < 18) then
   show "You are not eligible"
   if (eyesight result is failed) then
   show "You are not eligible"
   if (written result is failed) then
   show "You are not eligible, retake the test"
   if (driving result is failed) then
   show "You are not eligible"...
   if (age ≤ 60) then
   show "You are eligible for driving license" → otherwise ask for medical certificate
   if (applicant have medical certificate) then
   show "You are eligible for driving license".
   otherwise
   show "You are not eligible for driving license"

8. STOP

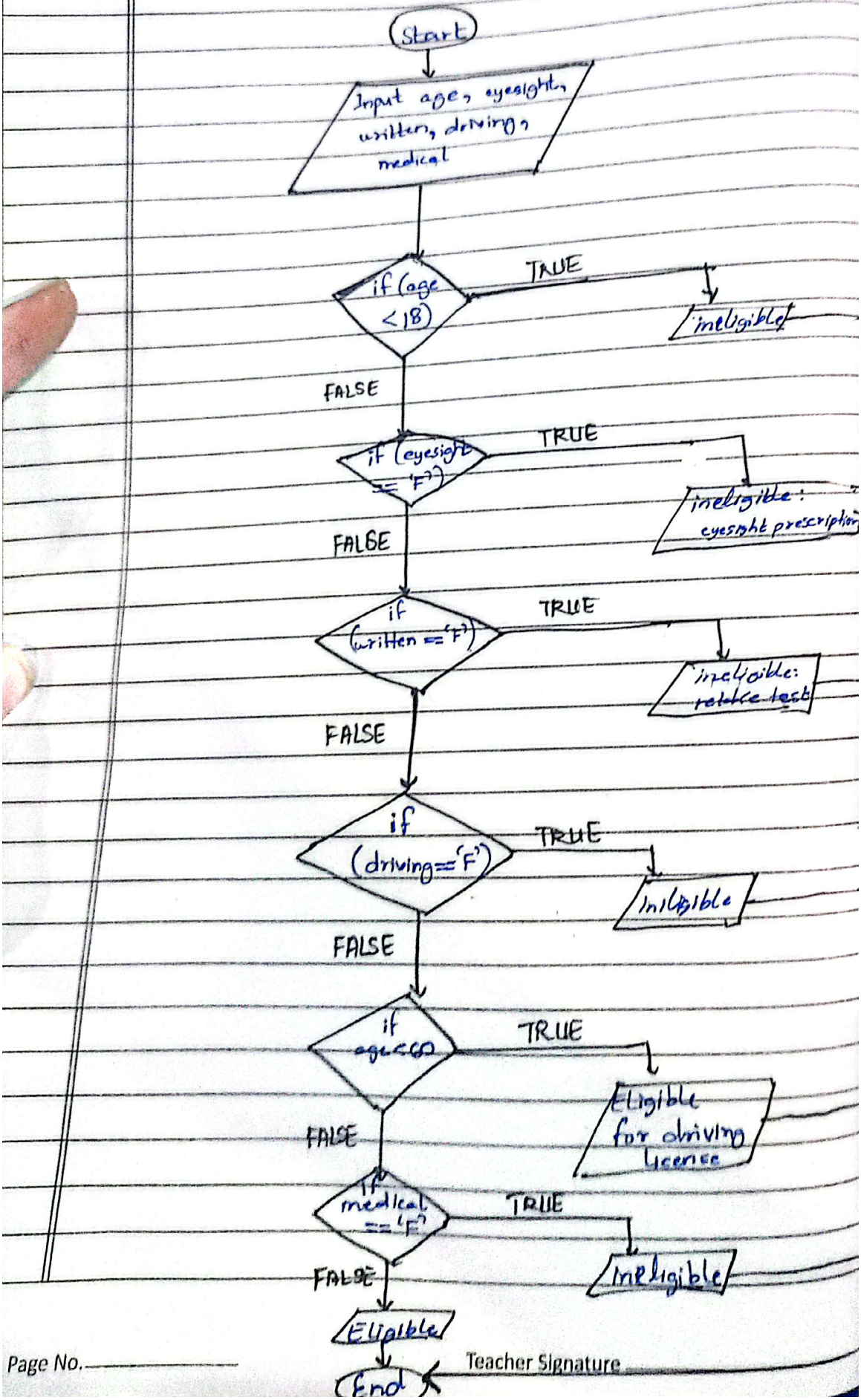
Pseudocode:

```
BEGIN

INPUT   applicant_age
INPUT   eyesight_result
INPUT   written_result
INPUT   driving_result
INPUT   medical_certificate

IF (applicant_age < 18) THEN
    PRINT " You are not eligible"
ELSE IF (eyesight_result = F) THEN
    PRINT " You are not eligible; need prescription for glasses"
ELSE IF (written_result = F) THEN
    PRINT " Retake the written test"
ELSE IF (driving_result = F) THEN
    PRINT " You are not eligible"
ELSE IF (applicant_age <= 60) THEN
    PRINT " You are eligible for driving license".
ELSE IF (medical_certificate = Y) THEN
    PRINT " You are eligible for driving license".
ELSE
    PRINT " You are not eligible for driving license".
ENDIF

END
```

otherwise ask for medical certificate

Date: Day:

Flowchart : (Question 3)



Page No. Teacher Signature

Question no. 4

1. Analysis :

PAC

Given Data	Required Results
5 cards (each 1–13)	Message stating whether or not full house
Processing Required	**Solution Alternative**
– Read 5 card values – Count how many times each card value repeats – If one value occurs 3 times and another occurs 2 times Print "Full House" – Otherwise Print "Not a Full House."	Loops (Haven't been learned yet)

IPO

Input	Processing	Output
5 cards (1-13)	1. Input 5 cards: num1, num2, num3, num4, num5	"Full House" or "Not Full House"
	2. Count occurrences of each card	
	3. Check if one count=3 and another count=2	
	4. If one value occurs 3 times and another occurs 2 times Print "Full House" Otherwise Print "Not a Full House"	

2. Designing:

Algorithm:

1. START
2. Input 5 cards : num1, num2, num3, num4, num5
3. Initialize counters : count1, count2, count3, count4, count5 to 0.
   Initialize threeFound = 0 , twoFound = 0
4. Count how many times each card appears by comparing it with all other cards. (for all num1, num2, num3, num4, num5) and store repetition to either threeFound or twoFound.
5. If count = 3 , set threeFound = 1
   If count = 2 , set twoFound = 1
6. If threeFound = 1 and twoFound = 1 then
   Print "Full House"
   Otherwise
   Print "Not a Full House"
7. STOP

Pseudocode:

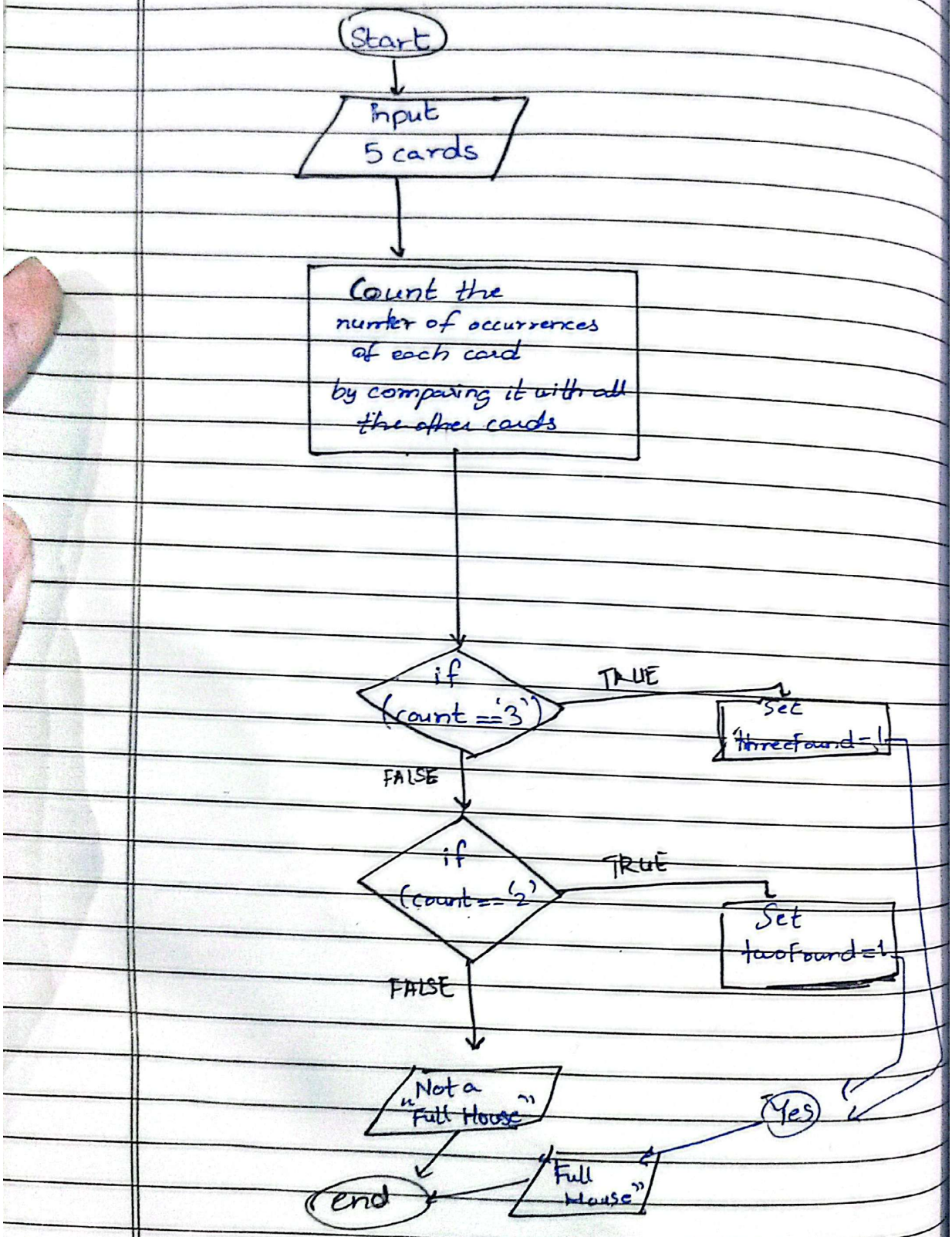
```
BEGIN

READ  num1, num2, num3, num4, num5
SET   count1, count2, count3, count4, count5 to 0
SET   threeFound to zero , twoFound to zero
```

```
IF num1 = num1  THEN  count1 ← count1 + 1
IF num2 = num1  THEN  count1 ← count1 + 1
IF num3 = num1  THEN  count1 ← count1 + 1
IF num4 = num1  THEN  count1 ← count1 + 1
IF num5 = num1  THEN  count1 ← count1 + 1
IF (count1 = 3)  threeFound = 1
IF (count1 = 2)  twoFound = 1
!!

IF num1 = num2  THEN  count2 ← count2 + 1
IF num2 = num2  THEN  count2 ← count2 + 1
IF num3 = num2  THEN  count2 ← count2 + 1
IF num4 = num2  THEN  count2 ← count2 + 1
IF num5 = num2  THEN  count2 ← count2 + 1
IF (count2 = 3)  threeFound = 1
IF (count2 = 2)  twoFound = 1

IF num1 = num3  THEN  count3 ← count3 + 1
IF num2 = num3  THEN  count3 ← count3 + 1
IF num3 = num3  THEN  count3 ← count3 + 1
IF num4 = num3  THEN  count3 ← count3 + 1
IF num5 = num3  THEN  count3 ← count3 + 1
IF (count3 = 3)  THEN  threeFound = 1
IF (count3 = 2)  THEN  twoFound = 1

IF num1 = num4  THEN  count4 ← count4 + 1
IF num2 = num4  THEN  count4 ← count4 + 1
IF num3 = num4  THEN  count4 ← count4 + 1
IF num4 = num4  THEN  count4 ← count4 + 1
IF num5 = num4  THEN  count4 ← count4 + 1
```

```
IF (count4 = 3)  THEN  threeFound = 1
IF (count4 = 2)  THEN  twoFound = 1

IF num1 = num5   THEN  count5 ← count5 + 1
IF num2 = num5   THEN  count5 ← count5 + 1
IF num3 = num5   THEN  count5 ← count5 + 1
IF num4 = num5   THEN  count5 ← count5 + 1
IF num5 = num5   THEN  count5 ← count5 + 1
IF (count5 = 3)  THEN  threeFound = 1
IF (count5 = 2)  THEN  twoFound = 1

END IF

IF threeFound = TRUE and twoFound = TRUE
    Print "Full House"
ELSE
    Print "Not a Full House"

END IF

END
```

Date: _____ Day: _____

Flowchart: (Question 4)



Question no: 5

1. Analysis:

PAC

Given Data	Required Results
User input. (0-9) invalid input (stop)	Formatted table showing count for each digit
Processing Required	**Solution Alternative**
- Initialize 10 counter variables - Read input and check validity - Update corresponding counter	Loops (Haven't learned yet)

IPO

Input	Processing	Output
User input (0-9) invalid input (stop)	1. Initialize 10 counter variables. 2. Read input and check validity. 3. Update corresponding counter.	Formatted table showing digit and its count

2. Designing:

Algorithm:

1. START
2. Initialize 10 counter variables (count0 to count9)
3. For each input, check if it's a single digit (0-9)
4. If valid, increment the corresponding counter
5. If invalid, stop reading input.
6. Display results in table format.
7. END

Pseudocode:

```
BEGIN

SET count0, count1, count2, count3, count4, count5,
    count6, count7, count8, count9 = 0

READ Inputs user_input (0-9)
(First input)
IF (input >= '0' AND input <= '9') THEN
    IF (input == '0') THEN
        SET count0 = count0 + 1
    ELSE IF (input == '1') THEN
        SET count1 = count1 + 1
    ELSE IF (input == '2') THEN
        SET count2 = count2 + 1
    ELSE IF (input == '3') THEN
```

```
    SET count3 = count3 + 1
ELSE IF (input== '4') THEN
    SET count4 = count4 + 1
ELSE IF (input== '5') THEN
    SET count5 = count5 + 1
ELSE IF (input== '6') THEN
    SET count6 = count6 + 1
ELSE IF (input == '7') THEN
    SET count7 = count7 + 1
ELSE IF (input == '8') THEN
    SET count8 = count8 + 1
ELSE IF (input == '9') THEN
    SET count9 = count9 + 1
END IF

(second input)
IF (input >= '0' AND input <= '9') THEN
   IF (input == '0') THEN
      SET count0 = count0 + 1
   ELSE IF (input == '1') THEN
      SET count1 = count1 + 1
   ELSE IF (input == '2') THEN
      SET
   ELSE IF (input == '3') THEN
      SET
   ELSE IF (input == '4') THEN
      SET
   ELSE IF (input == '5') THEN
      SET
   ELSE IF (input == '6') THEN
```

```
ELSE IF (input == '7') THEN
    SET
ELSE IF (input== '8') THEN
    SET
ELSE IF (input == '9') THEN
    SET
END IF
```

(third input)

11 11 11 11 11 11

(fourth input)

1111 1111

(fifth input)

1111 1111

& so on till nine

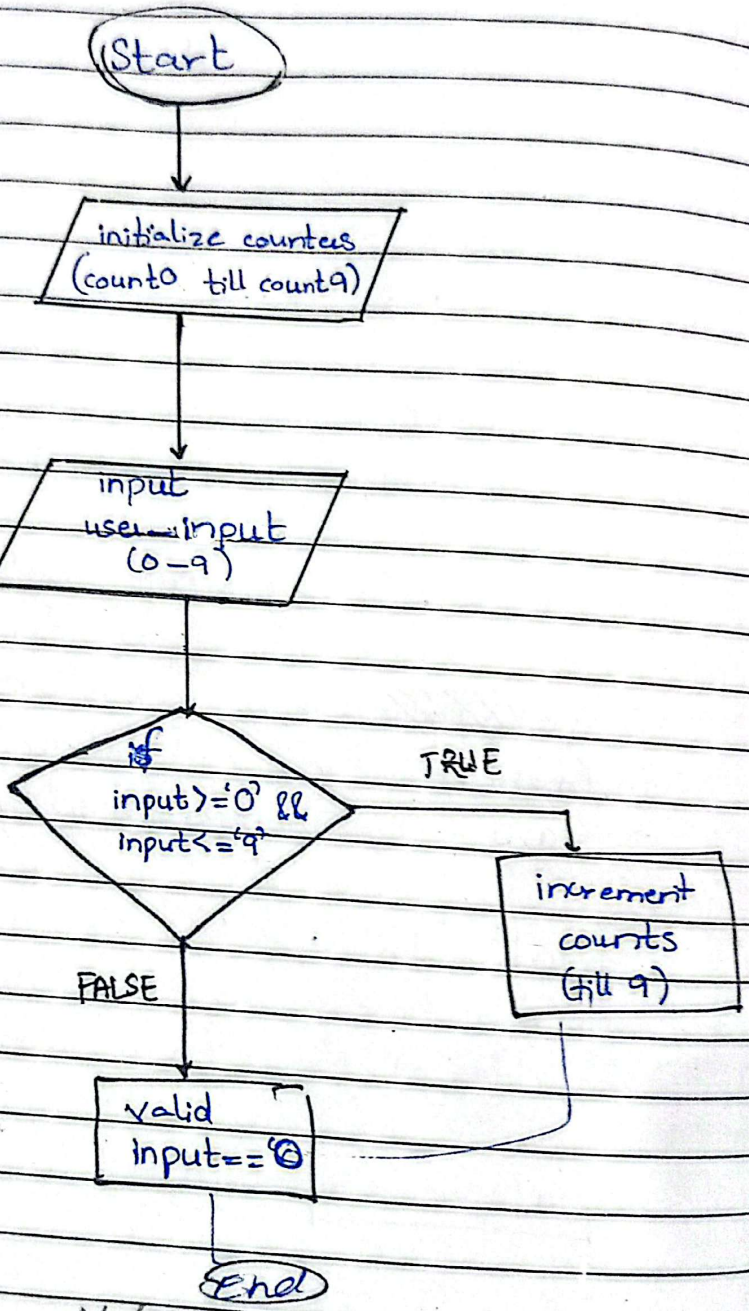
Same as above

DISPLAY results in table format

END

Date: _____ Day: _____

Flowchart: (Q5, Part A)



Note: Repeat the same pattern for multiple inputs
Continue it for as many inputs as needed

PART 2

Question no. 5: Code of program shared via SS.

X ⟶ not executed

– ⟶ ignored by compiler

Question no. 6: Main 'if' block, else block

				(if)				(else if)		(else)
					(Nested) if	else			else	
	i	j	K	i<j	j<K	i = j	j=K	j>K	j = i	i=K
a)	3	5	7	T	T	i=5	X	–	–	–
b)	3	7	5	T	F	X	j=5	–	–	–
c)	5	3	7	F	–	–	–	F	X	i=7
d)	5	7	3	T	F	X	j=3	–	–	–
e)	7	3	5	F	–	–	–	F	X	i=5
f)	7	5	3	F	–	–	–	T	j=7	X

The Code will Print :

(a) 5 5 7

(b) 3 5 5

(c) 7 3 7

(d) 5 3 3

(e) 5 3 5

(f) 7 7 3

Date: _____ Day: _____

All codes of

Part A Questions

(Q1, Q2, Q3, Q4, ~~Q5~~)

Part B Questions

(Q5 , Q7)

Are uploaded in the other PDF FILE