FXPERIMENT-6

OBJECTIVE

Study of Demoryon's Theorem

THEORY

There are actually two theorems that were put forward by De-Hargon. On the basis of De-Margon's laws much basis a algebra are solved. Solving these types of algebra with De-Margons theorem has a major application in the field of digital electronics. De-Margons theorem can be stated as follows:

The compliment of the product of two variables is equal to the sum of the compliment of each variable. Thus according to be-Margans laws or De-Margan's theorem if A&B are the two variables or boolean numbers. Then ourdingly

(A.B)'= A'+B'

The complement of the sum of two variables is equal to the product of the complement of each variable.

Thus according to De-Maryonis theorem if A&B are the two variables then

(A+B)' = A'.B'

Theorem -t:
$$(A \cdot B)' = A' + B'$$

$$A \xrightarrow{1 \longrightarrow 0} 0 \xrightarrow{2} y = (A \cdot B)^{1} = B \xrightarrow{3 \longrightarrow 0} 2$$

LHS: (A.B)

A	В	A·B	Y = (A - B)		
0	0	0	mile China		
0	L	0	Marine in		
1	0	0			
1	1	ı	0		

RHS: (A'+ B')

A	B	A'	8'	2 = A'+B'
6	6	1	01	- 11 + 18
0	t	ı	0	
U	0	0	1	
1.	ı	0		N. S. W.

EQUIPMENT NEEDED:

Compagent	Quantity
10 IC 7400 2 input NAND yete	- quantity
(2) IC 7432 2 input OR and	1
3) IC 7404 NOT yate	The second
9 IC 7402 2 input NOR gate	
(5) IC 7408 2 input AND gate	8 1

PROCEDURE:

When switch is prosed it industes switch is in HIGH position.

Theorem 1: (A.B) = A'+B'

Left Hand Side: (A-B)

- 1) Make commertions on bread board as shown in figure
- 2) connect +5v to pin 14 & GND to pin 7
- 3) Connect engula A&B(i.e pin 122) to IO&II of 10 input switches.
- 4) Set the input switches so & SI initially to LOW position
- 5) Connect output Y (i.e pin 3) to OD of 10 output LED indicator
- 6) Switch ON the power supply
 7) Observe output on LED 10 of 10 Centrut LED indicator
 8) Observe the output for different input combinations.

Theorem-z:
$$(A+B)'=A'\cdot B'$$

$$\frac{1}{8}$$

$$\frac{3}{2}$$

$$Z = A' \cdot B$$

A	в	A+B	Y= (A+B)'
0	0	0	1
0	1	1	0
- 1	0	1	0
1	1	late 1	0

RHS : A'. B'

A	B	A'	B ,	z = A'.B'
0	0	1	1	" 8
0	12	1	0	20 00 100
/1	0	0	and the same of	0
1	1	0		0

Right Hand Side: (A'+B') 2) Connect +5v to pin 14 & CAND to pin 7
3) Connect inputs A&B (ic pin 183) to IZBI3 of 10 input s) Set the input switches 32 & 53 initially to LOW position.

5) Connect auteut Z (pin 3 of IC 7432) to 01 y 10 autput CED industar. 3) Switch ON the power supply
3) Observe output on LED LI of 10 Output LED indicator
3) Observe the output for different input combinations o CONCLUSTON: From the truth tables, it is clear that 7=2 & here De-Maryons Theren 1 is verified PROCEOURF when south is pressed it indicates south is in HIGH position Theorem - 2: $(A+B)' \neq A' \cdot B'$ Left Hand Side: (A+B)' 1) Hobe consultions on bread board as shown in figure 2) Connect +5v to pin 14 & GND to pin 7 3) Connect inputs A&B (i.e pin 2&3) to IO2II of 10 injust switches, respectively. FOR EDUCATIONAL USE

- 4) Set the input switches so & \$1 initially to LOW position
 5) Connect output Y (i.e pin 1) to 00 of 10 output LED indicator
 6) Switch on power supply
 7) Observe output on LED LO of 10 output LED indicator.
 8) Observe the output for diffrent input combinations.

Right Mand Side: (A'B')

1) Make connections on bread board as shown in figure

2) Connect +5v to gin 14 & GND to gin 7
3) Connect inputs ARB(i-e 183) to IZ2 I3 of 10 input suitches, respectively

4) Set the input switches SZ 253 initially to LOW position
5) Connect autput 2(i.e pin 3) to 03 of 10 output LED indicates

6) Switch on the power supply.

- 7) Observe output on LED LZ of 10 output LED indicator. 8) Observe the output for different input compinations

CONCLUSION:

From the truth tables, it is clear that, Y=2 & herce De-Margon's Theorem 2 is verified.

Conclusion:

1) From the truth tables it is clear, that 4=2 & Memorgans
theorem 1 is confirmed.

2) From the truth tables it is clear. that y=z > 0-Maryons.

Theorem z is confirmed.

Assessment of the Experiment / Assignment :

Timely Submission (07)	Presentation (06)	Understanding (12)	Total (25)	Signature of Teacher with date
07	06	T Une	24	DRU 14/10/24