Homework 19F-0228

Q1: Design and implement Even parity Generator for 3-bit binary Number.

ANS.

⇒ Truth-Table:

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

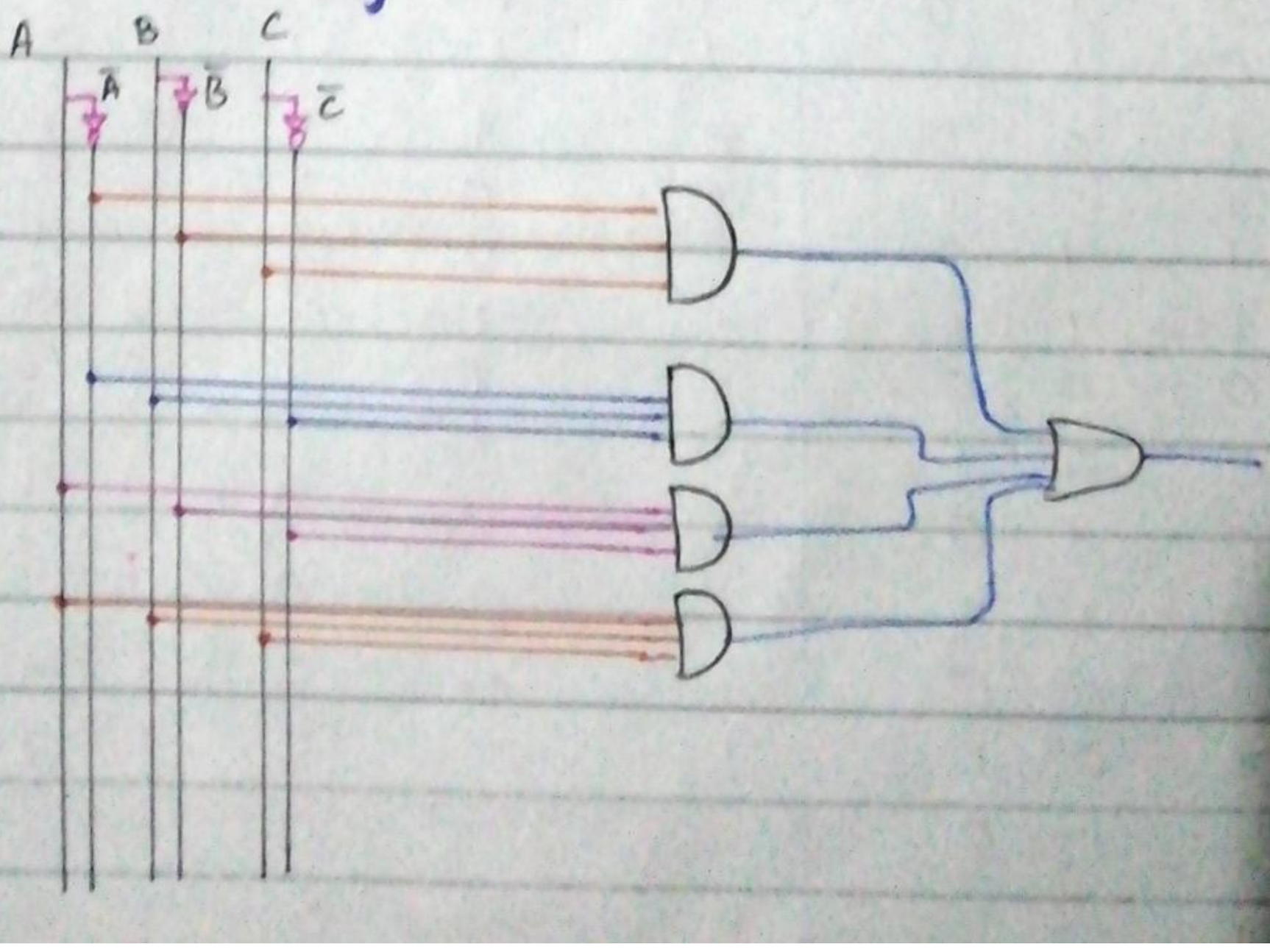
⇒ k-map:

A \ BC	00	01	11	10
0	0	1	0	1
1	1	0	1	0

⇒ Equation:

$F(A,B,C) = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$

⇒ Circuit Diagram:



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Q2. ODD PARITY FUNCTION

D_1	D_2	D_3	D_4	P
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

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k-map

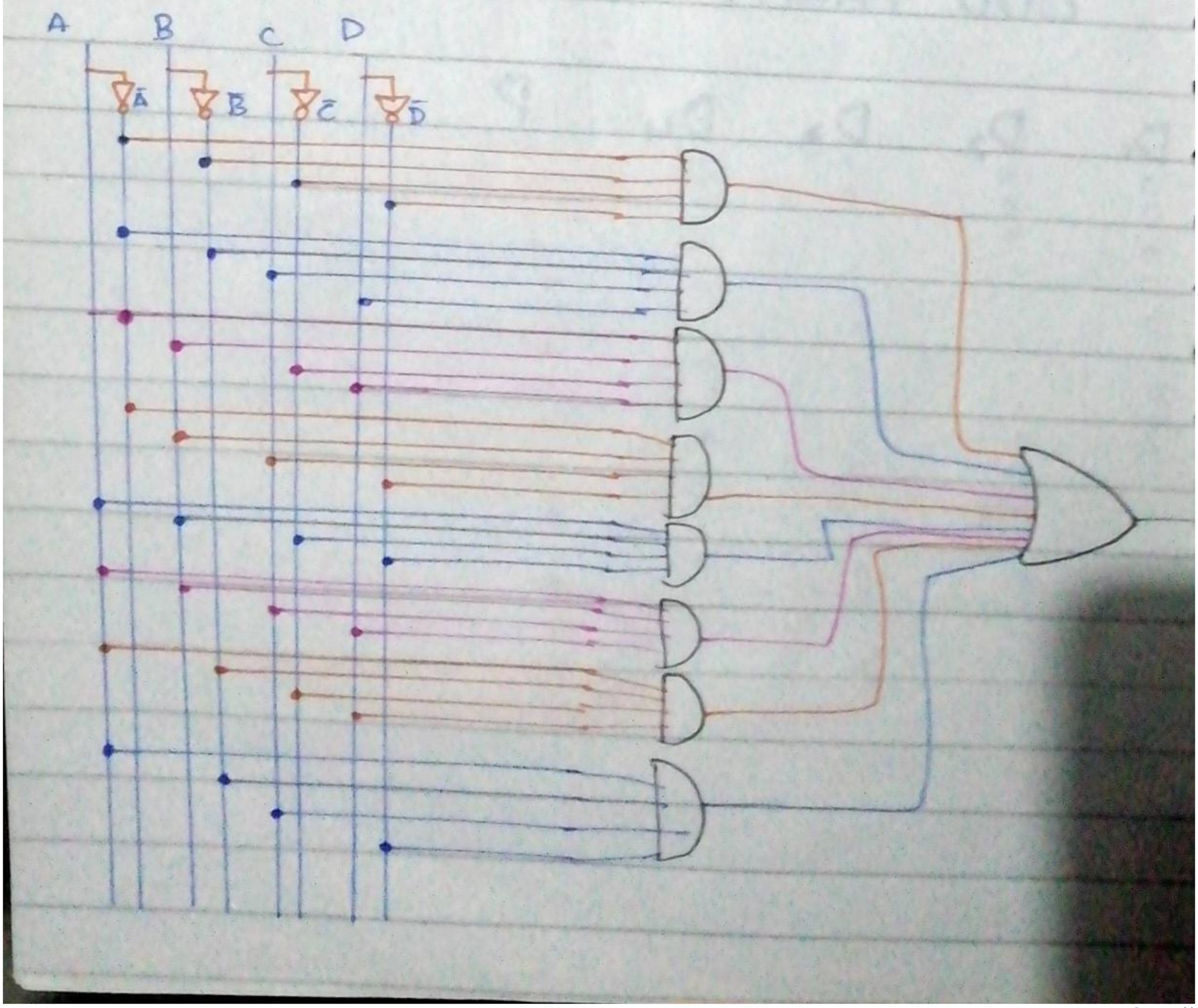
	00	01	11	10
00	1	0	1	0
01	0	1	0	1
11	1	0	1	0
10	0	1	0	1

∵ No-pair

Equation:

$$= \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}CD + \bar{A}B\bar{C}D + \bar{A}BC\bar{D} + AB\bar{C}\bar{D} + ABCD + A\bar{B}\bar{C}D + A\bar{B}C\bar{D}$$

Circuit:



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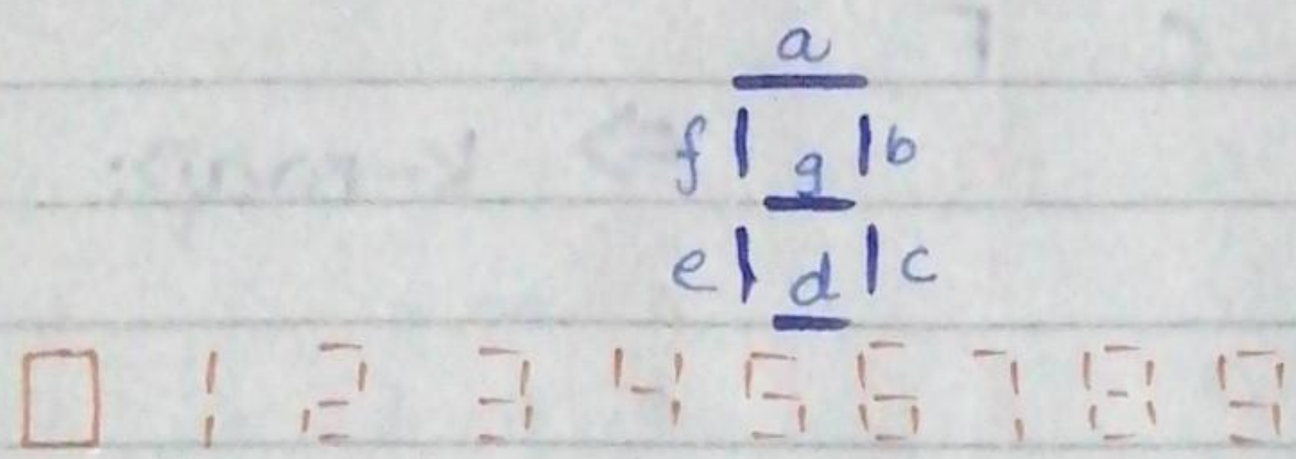
Q3:

Complete and design BCD to 7 segment Display circuit.

UNUSED COMBINATION GIVE E FOR ERROR.



Solution:

Truth table

A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1
1	0	1	0	1	0	0	1	1	1	1
1	0	1	1	1	0	0	1	1	1	1
1	1	0	0	1	0	0	1	1	1	1
1	1	0	1	1	0	0	1	1	1	1
1	1	1	0	1	0	0	1	1	1	1
1	1	1	1	1	0	0	1	1	1	1

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K-maps

AB \ CD	00	01	11	10
00	1	0	1	1
01	0	1	1	1
11	1	1	1	1
10	1	1	1	1

$F(A,B,C,D) = BD + A + C + \bar{B}\bar{D}$

AB \ CD	00	01	11	10
00	1	1	1	1
01	1	0	1	0
11	0	0	0	0
10	1	0	1	0

$F = \bar{A}\bar{B} + \bar{B}\bar{C} + \bar{A}\bar{C}\bar{D} + \bar{A}CD$

AB \ CD	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	0	0	0	0
10	1	1	0	0

$F = \bar{A}D + \bar{A}B + B\bar{C}$

AB \ CD	00	01	11	10
00	1	0	1	1
01	1	0	1	0
11	1	1	1	1
10	1	0	1	1

$F = A + C\bar{D} + B\bar{C}D + \bar{B}C + \bar{B}\bar{D}$

AB \ CD	00	01	11	10
00	1	0	0	1
01	0	0	0	1
11	1	1	1	1
10	1	0	1	1

$F = AB + C\bar{D} + A\bar{C} + \bar{B}\bar{D}$

AB \ CD	00	01	11	10
00	0	0	1	1
01	1	1	0	1
11	1	1	1	1
10	1	1	1	1

$F = A + \bar{C}\bar{D} + B\bar{C} + B\bar{D}$

AB \ CD	00	01	11	10
00	0	0	1	1
01	1	1	0	1
11	1	1	1	1
10	1	1	1	1

$\bar{F} = A + C\bar{D} + B\bar{C} + \bar{B}C$

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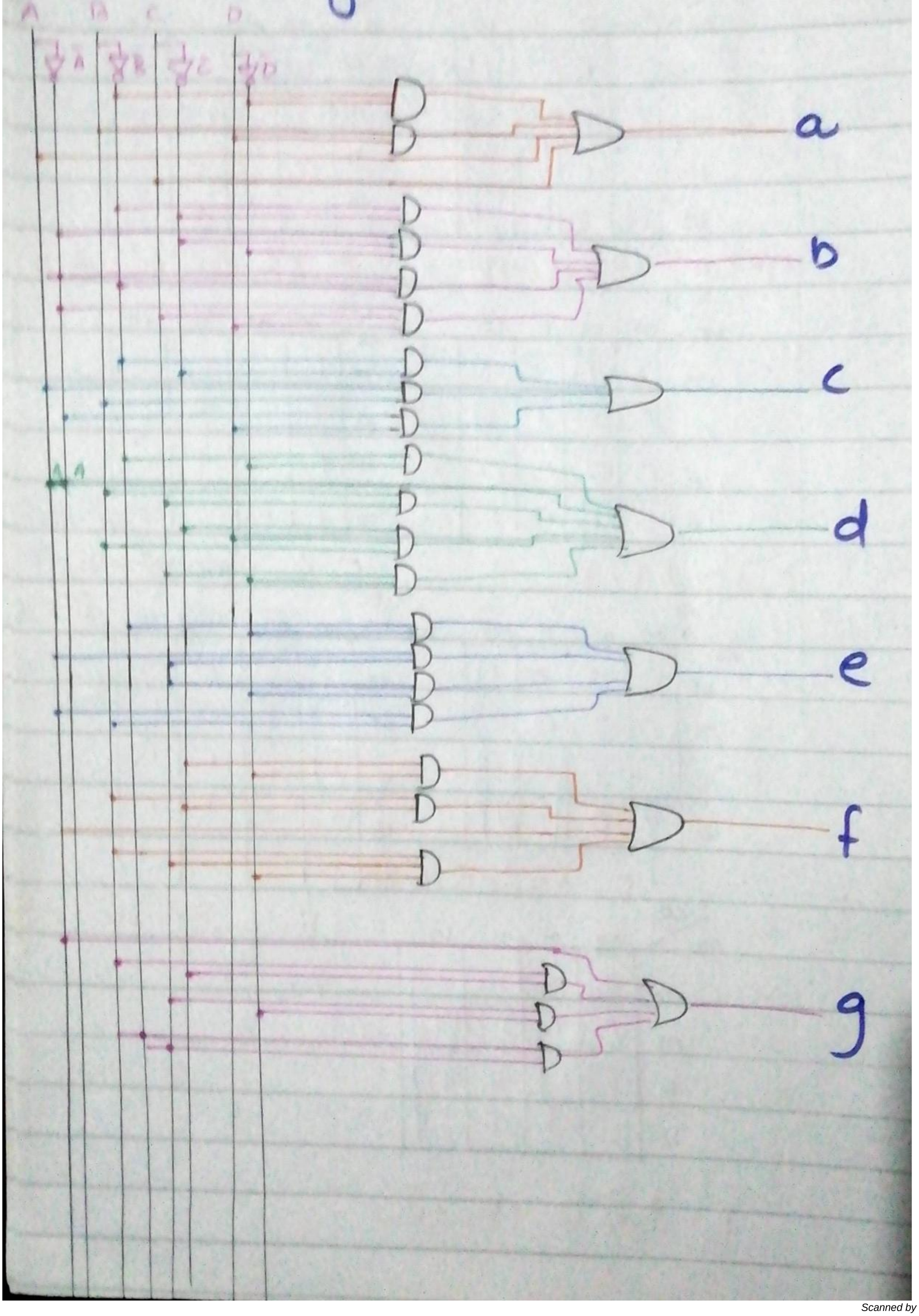
Circuit Diagram



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