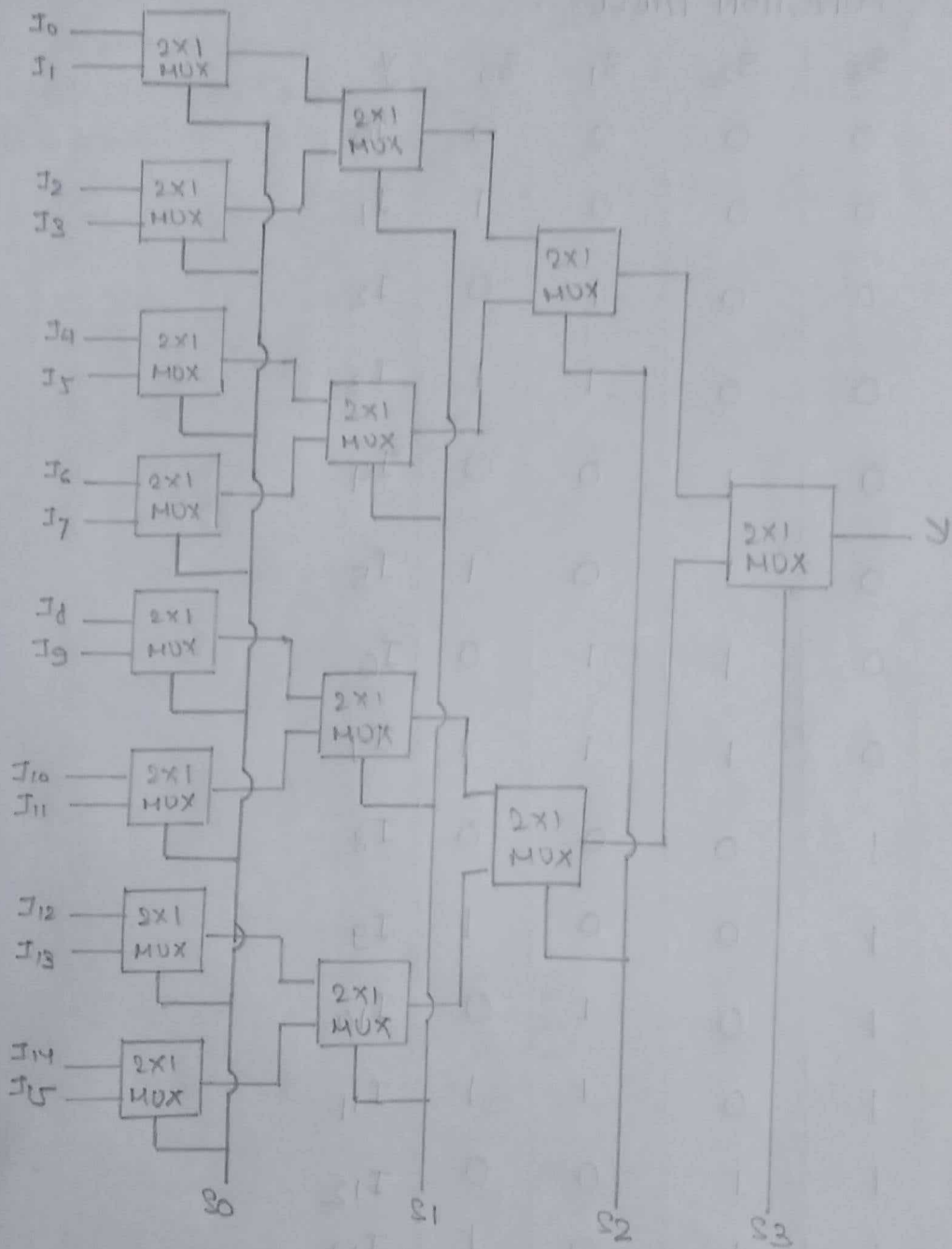


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1.



16:1 MUX USING 2:1 MUX

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1. FUNCTION TABLE

S_3	S_2	S_1	S_0	y
0	0	0	0	I_0
0	0	0	1	I_1
0	0	1	0	I_2
0	0	1	1	I_3
0	1	0	0	I_4
0	1	0	1	I_5
0	1	1	0	I_6
0	1	1	1	I_7
1	0	0	0	I_8
1	0	0	1	I_9
1	0	1	0	I_{10}
1	0	1	1	I_{11}
1	1	0	0	I_{12}
1	1	0	1	I_{13}
1	1	1	0	I_{14}
1	1	1	1	I_{15}

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(3)

2. Given $\Sigma m(1, 3, 5, 7, 10, 12, 15) = F(A, B, C, D)$

No. of inputs $= n = 4$

No. of selection lines $= n - 1 = 3$

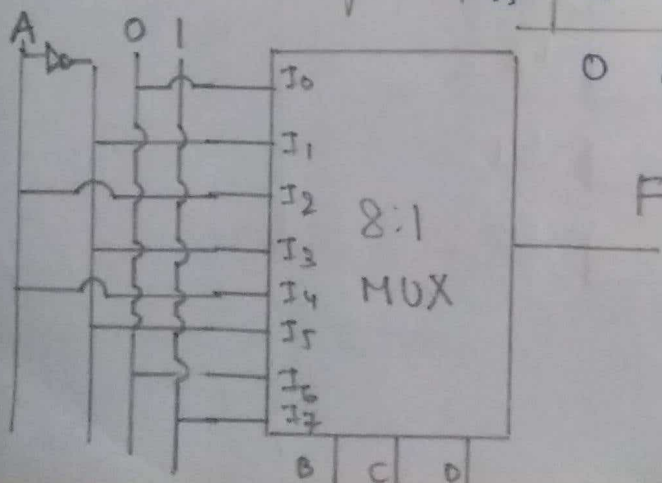
MUX used $= 2^{n-1} : 1 = 2^3 : 1 = 8 : 1$

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

Selection lines : B C D

B	C	D	F
0	0	0	I_0
0	0	1	I_1
0	1	0	I_2
0	1	1	I_3
1	0	0	I_4
1	0	1	I_5
1	1	0	I_6
1	1	1	I_7

	I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7
A'	0	①	2	③	4	⑤	6	⑦
A	8	9	⑩	11	⑫	13	14	⑮
	0	A'	A	A'	A	A'	0	1

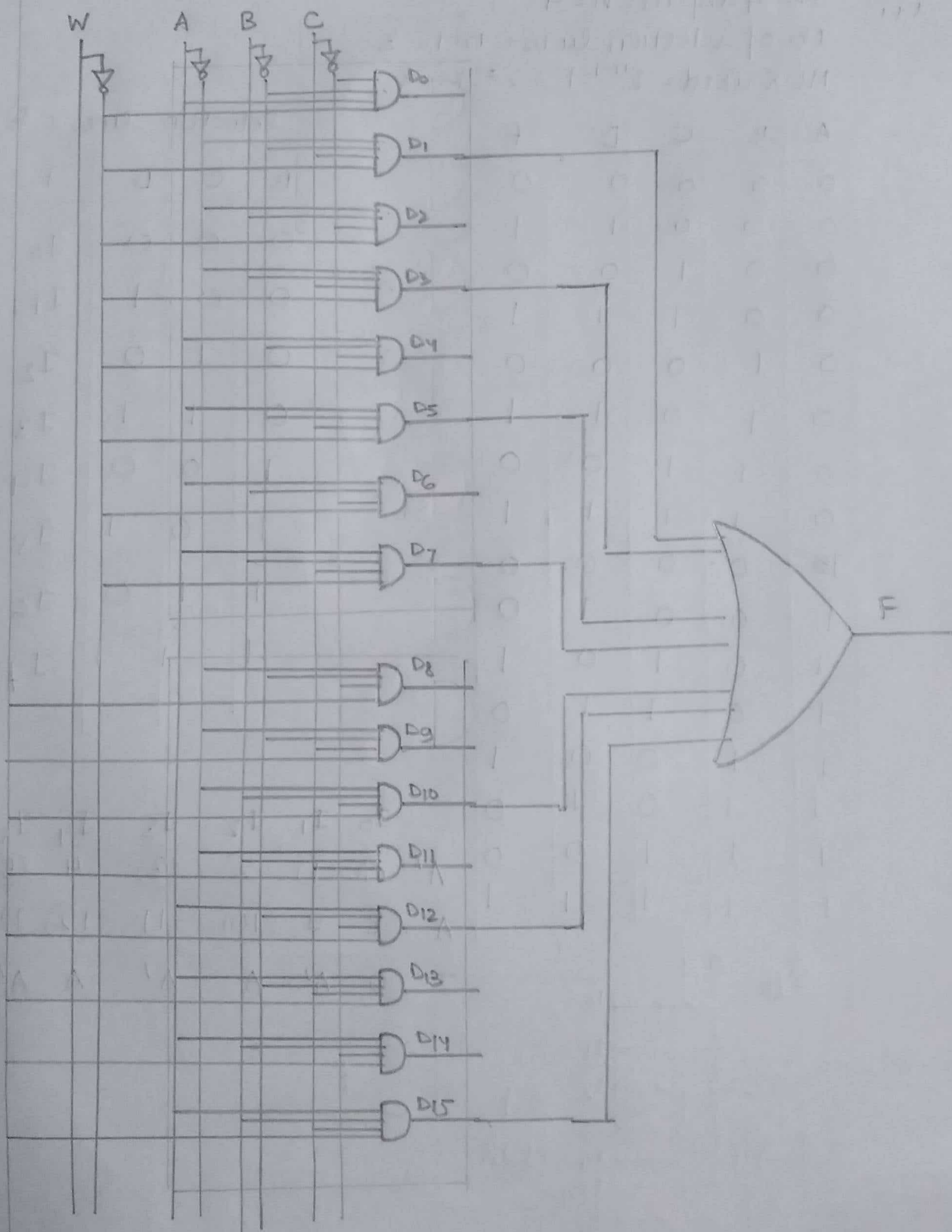


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3. Given $\Sigma m(1, 3, 5, 7, 10, 12, 15)$



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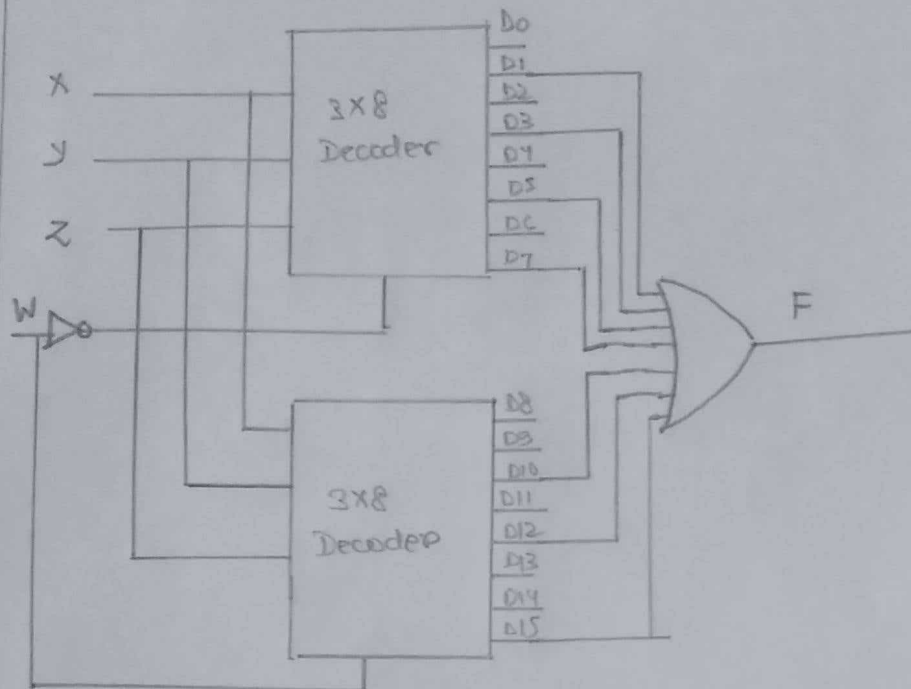
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4) $F(A, B, C, D) = \sum m(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$

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

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

The reduced expression is $\bar{C} + B\bar{D} + \bar{A}\bar{D}$

$$(m_0, m_1, m_4, m_5, m_{12}, m_{13}, m_8, m_9) = \bar{C}$$

$$(m_4, m_{12}, m_6, m_{14}) = B\bar{D}$$

$$(m_0, m_2, m_4, m_6) = \bar{A}\bar{D}$$