

AIM OF THE EXPERIMENT:

TO design and verify 8:3 binary encoder

Truth table

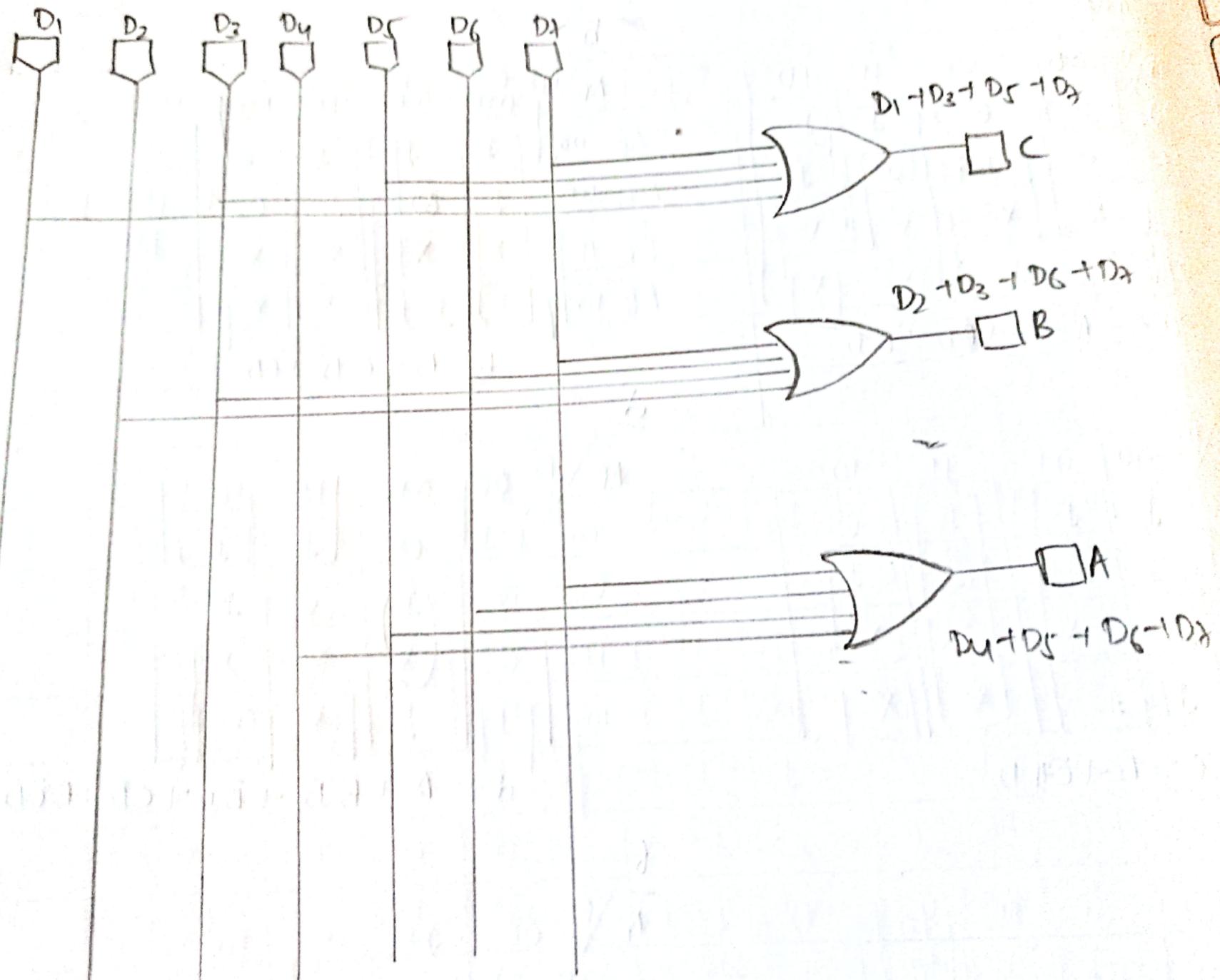
Inputs								outputs		
D ₀	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	A	B	C
1	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	1	0
0	0	0	1	0	0	0	0	0	1	1
0	0	0	0	1	0	0	0	1	0	0
0	0	0	0	0	1	0	0	1	0	1
0	0	0	0	0	0	1	0	1	1	0
0	0	0	0	0	0	0	1	1	1	1

$$A = D_4 + D_5 + D_6 + D_7$$

$$B = D_3 + D_4 + D_5 + D_7$$

$$C = D_1 + D_3 + D_5 + D_7$$

Expt. No. _____



AIM OF THE EXPERIMENT:
TO design and verify 4:2 priority encoder

Truth table:

w_3	w_2	w_1	w_0	y_1	y_0	
0	0	0	0	X	X	
0	0	0	1	0	0	
0	0	1	X	0	1	
0	1	X	X	1	0	
1	X	X	X	1	1	

	Inputs				Outputs		
	w_3	w_2	w_1	w_0	y_1	y_0	
0000	0	0	0	0	X	X	
0001	0	0	0	1	0	0	
001X	0	0	1	0	0	1	
	0	0	1	1	0	1	
01XX	0	1	0	0	1	0	
	0	1	0	1	1	0	
	0	1	1	0	1	0	
	0	1	1	1	1	0	
1XXX	1	0	0	0	1	1	
	1	0	0	1	1	1	
	1	0	1	0	1	1	
	1	0	1	1	1	1	
	1	1	0	0	1	1	
	1	1	0	1	1	1	
	1	1	1	0	1	1	
	1	1	1	1	1	1	

Teacher's Signature _____

Y_1

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

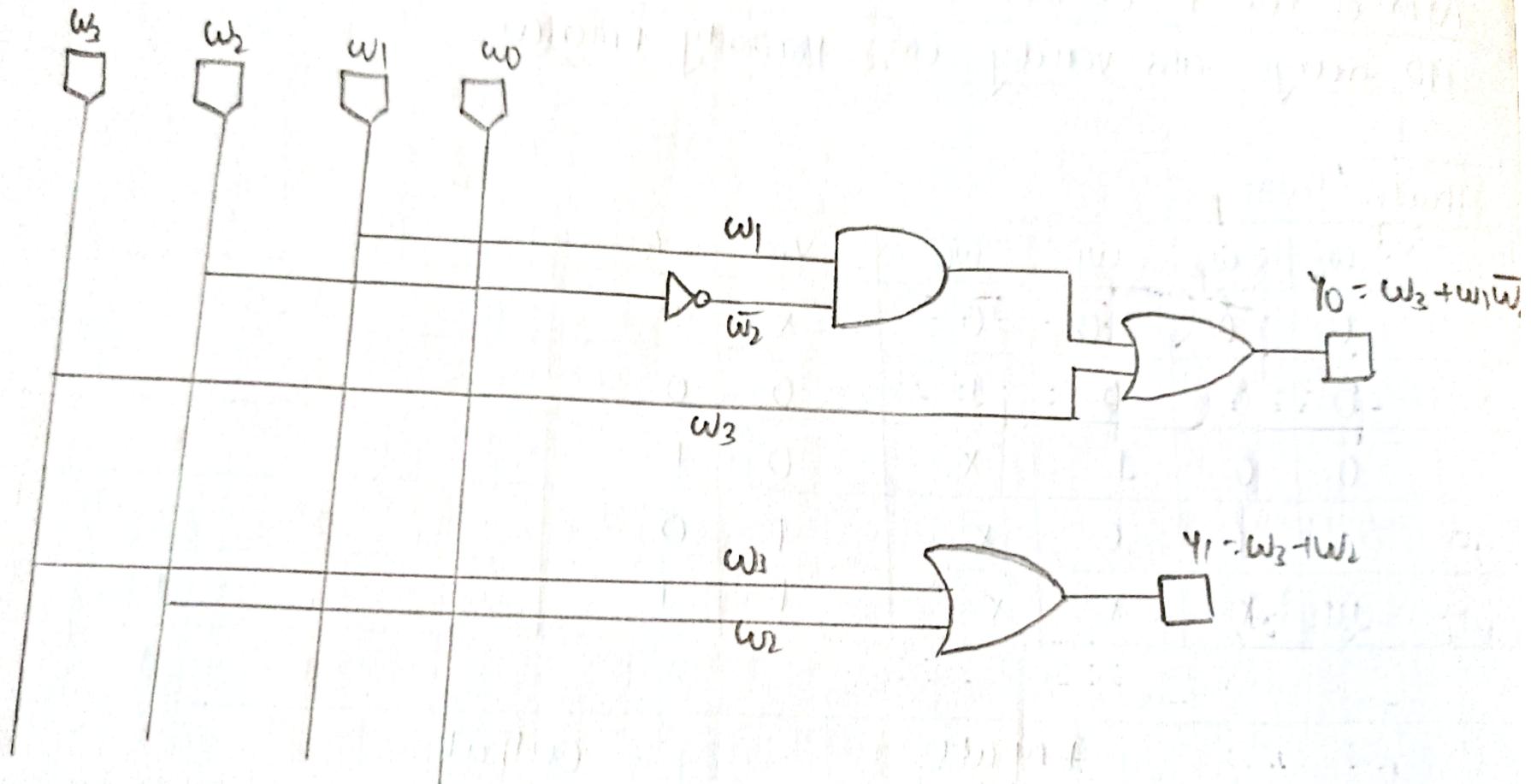
$$Y_1 = w_3 + w_2$$

 Y_0

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

$$Y_0 = w_3 + w_1 \bar{w}_2$$

CIRCUIT DIAGRAM:



AIM OF THE EXPERIMENT:

TO design and verify 8:3 priority encoder

Truth table:

Inputs									Outputs		
D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀		Q ₂	Q ₁	Q ₀
0	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	1	X	0	0	0	1
0	0	0	0	0	1	X	X	0	1	0	
0	0	0	0	1	X	X	X	0	1	1	
0	0	0	1	X	X	X	X	1	0	0	
0	0	1	X	X	X	X	X	1	0	1	
0	1	X	X	X	X	X	X	1	1	0	
1	X	X	X	X	X	X	X	1	1	1	

$$\begin{aligned}
 Q_0 &= D_7 + \bar{D}_7 \bar{D}_6 D_5 + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1 \\
 &= D_7 + \bar{D}_6 D_5 + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1 \\
 &= \underline{D_7} + \bar{D}_6 D_5 + \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 + \underline{\bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1} \\
 &= \underline{D_7} + \bar{D}_6 D_5 + \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 + \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1 \\
 &= D_7 + \bar{D}_6 (D_5 + \bar{D}_5 \bar{D}_4 D_3 + \bar{D}_5 \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1) \quad A \oplus \bar{B} = A \bar{B} + \bar{A} B \\
 &= D_7 + \bar{D}_6 (D_5 + \bar{D}_4 D_3 + \bar{D}_5 \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1) \\
 &= D_7 + \bar{D}_6 (D_5 + \bar{D}_4 D_3 + \bar{D}_4 \bar{D}_3 \bar{D}_2 D_1) \\
 &= D_7 + \bar{D}_6 (D_5 + \bar{D}_4 D_3 + \bar{D}_4 \bar{D}_2 D_1) \\
 &= D_7 + \bar{D}_6 D_5 + \bar{D}_6 \bar{D}_4 D_3 + \bar{D}_6 \bar{D}_4 \bar{D}_2 D_1 \\
 &= D_7 + \bar{D}_6 (D_5 + \bar{D}_4 D_3 + \bar{D}_4 \bar{D}_2 D_1)
 \end{aligned}$$

Teacher's Signature _____

$$\begin{aligned}
 Q_1 &= (D_7 + \bar{D}_7 D_6) + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 D_2 + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 \\
 &= D_7 + D_6 + \bar{D}_6 \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 D_2 + \bar{D}_7 \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 \\
 &= D_7 + (D_6 + \bar{D}_6 \bar{D}_5 \bar{D}_4 \bar{D}_3 D_2) + \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 \quad (A + \bar{A}B) = A + B \\
 &= D_7 + D_6 + \bar{D}_5 \bar{D}_4 \bar{D}_2 D_2 + \bar{D}_6 \bar{D}_5 \bar{D}_4 D_3 \\
 &= D_7 + D_6 + (\bar{D}_5 \bar{D}_4 \bar{D}_3 D_2 + \bar{D}_5 \bar{D}_4 D_3) \\
 &= D_7 + D_6 + \bar{D}_4 \bar{D}_5 (D_3 + D_2) \\
 &= D_7 + D_6 + \bar{D}_4 \bar{D}_5 (D_3 + D_2)
 \end{aligned}$$

$$\begin{aligned}
 Q_2 &= (D_7 + \bar{D}_7 D_6) + \bar{D}_7 \bar{D}_6 D_5 + \bar{D}_7 \bar{D}_6 \bar{D}_5 D_4 \\
 &= D_7 + D_6 + \bar{D}_7 \bar{D}_6 D_5 + \bar{D}_7 \bar{D}_6 \bar{D}_5 D_4 \quad A + \bar{A}B = A + B \\
 &= D_7 + (\bar{D}_6 D_5 + D_6) + \bar{D}_6 \bar{D}_5 D_4 \\
 &= D_7 + D_5 + (D_6 + \bar{D}_6 \bar{D}_5 D_4) \\
 &= D_7 + D_5 + D_6 + \bar{D}_5 D_4 \\
 &= D_7 + D_6 + (D_5 + \bar{D}_5 D_4) \\
 &= D_7 + D_6 + D_5 + D_4 \\
 &= D_7 + D_5 + D_6 + D_7
 \end{aligned}$$

CIRCUIT DIAGRAMS

