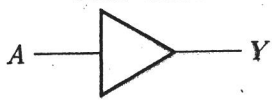
Build a Digital Clock from the 1980's

Lecture 2B: Making Circuits That Remember Stuff

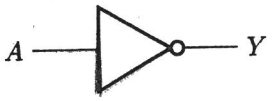
Original photo from https://alum.mit.edu/slice/tim-beaver-exclusive-interview
Edited using the GNU Image Manipulation Program (https://www.gimp.org/)

YES Gate



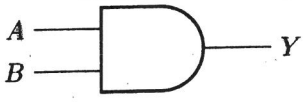
A	Y
0	0
1	1

NOT Gate



A	Y
0	1
1	0

AND Gate

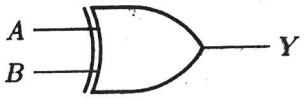


A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

OR Gate

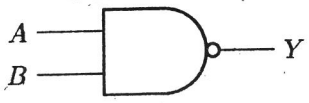
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

XOR Gate



A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

NAND Gate

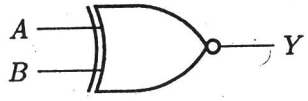


A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

NOR Gate

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

XNOR Gate

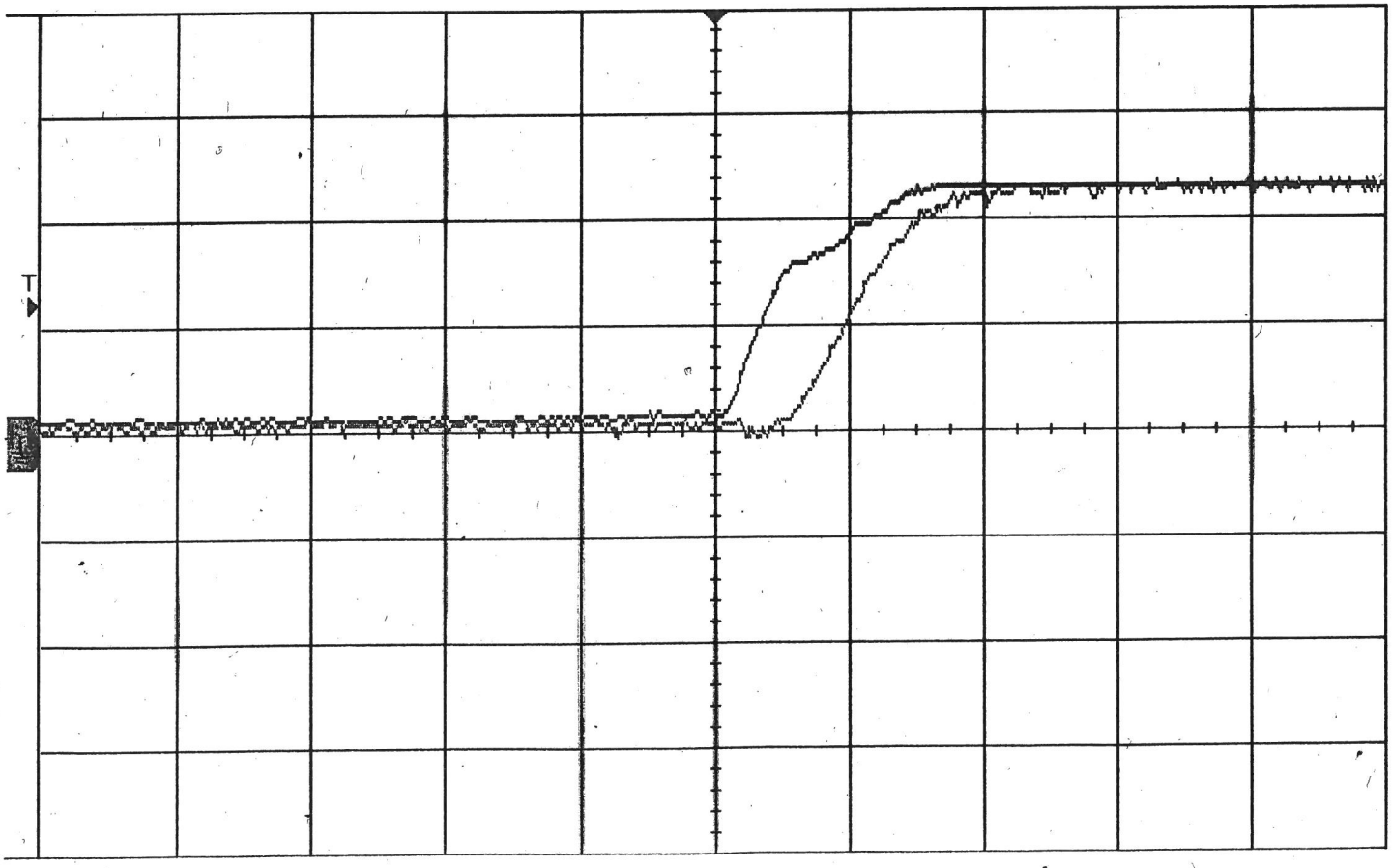


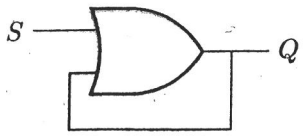
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	A or B	Y	R_L = 2 kΩ, C_L = 15 pF		14	22	ns
t_{PHL}					14	22	ns

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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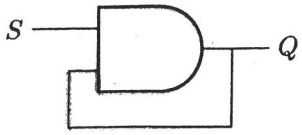
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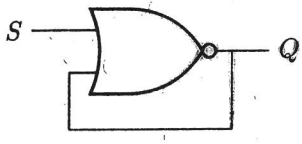
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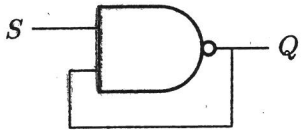
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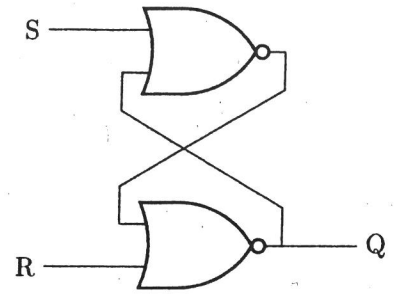
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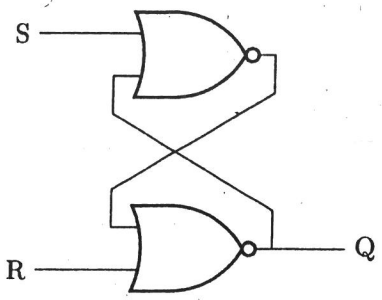
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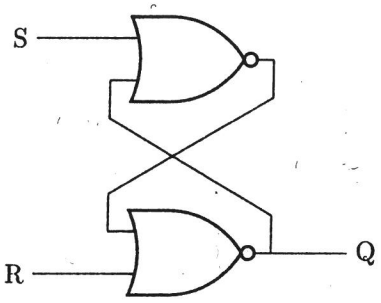
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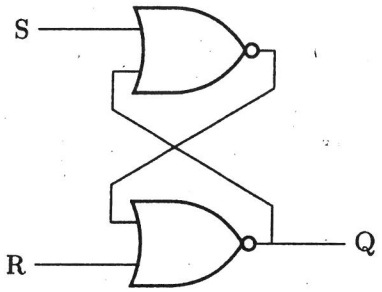
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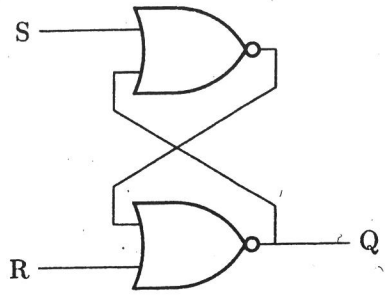
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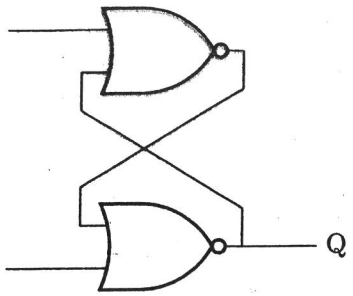
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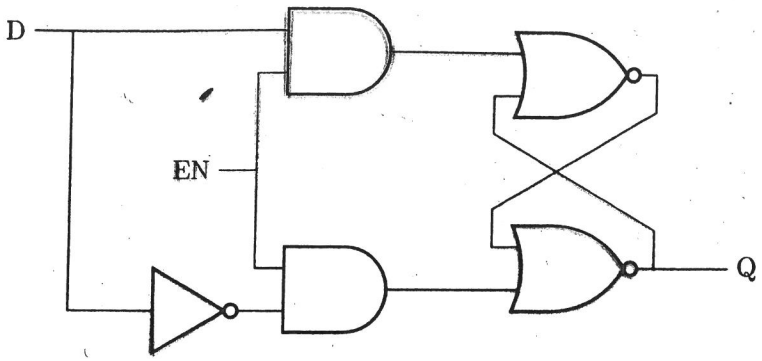
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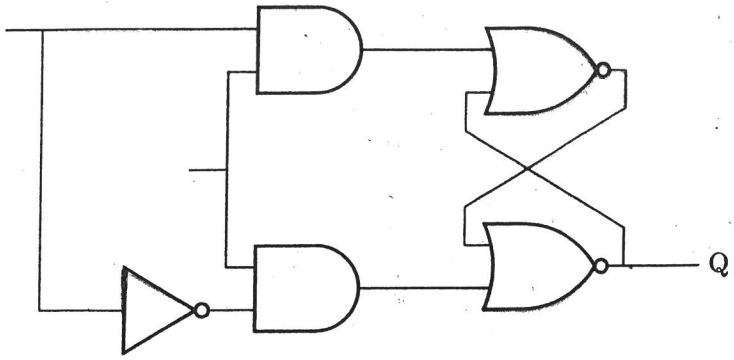
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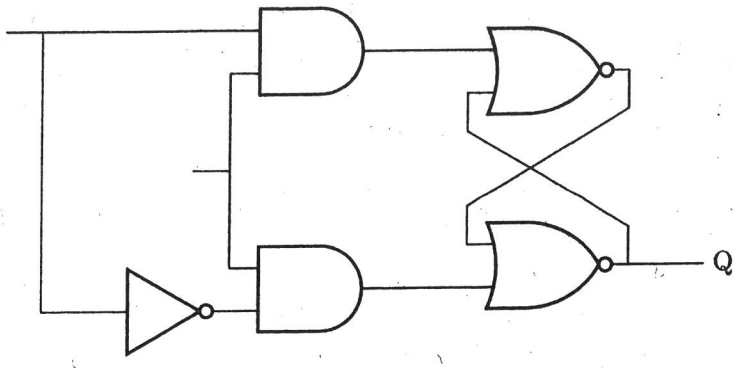
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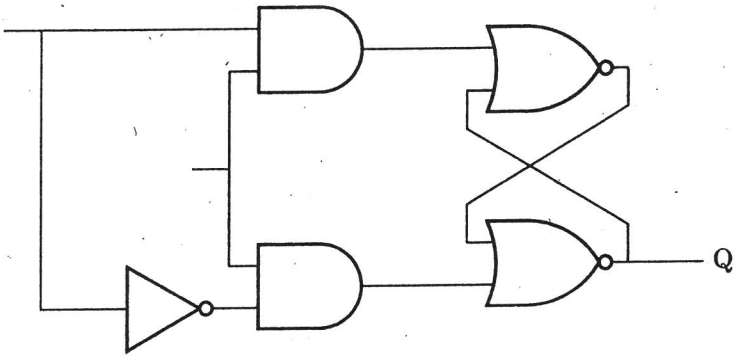
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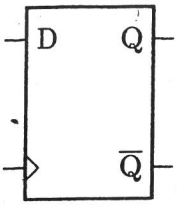
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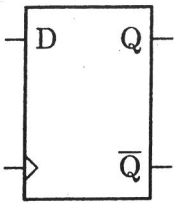
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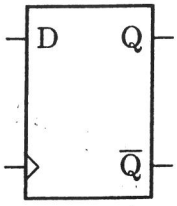
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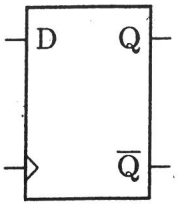
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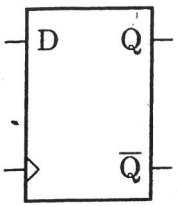
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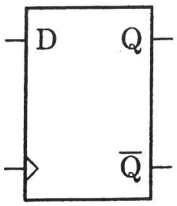
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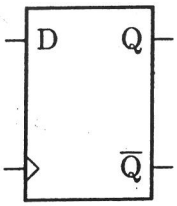
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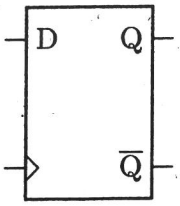
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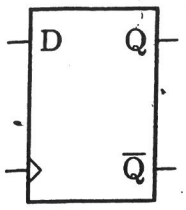
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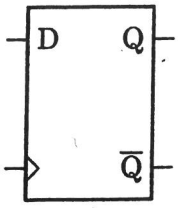
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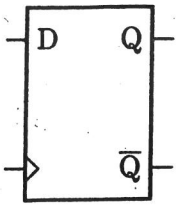
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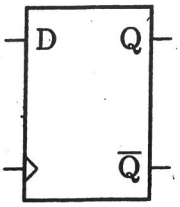
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