

Experiment #1:

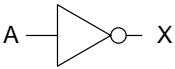
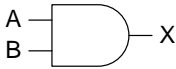
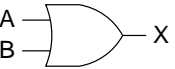
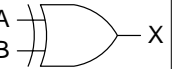
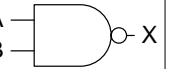
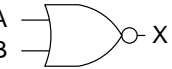
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(ii)																																																																																							
(iii)	$X = \bar{A}$	$X = A B$	$X = A + B$	$X = A \oplus B$	$X = \overline{A B}$	$X = \overline{A + B}$																																																																																	
(iv)	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr><th>A</th><th>X</th></tr> </thead> <tbody> <tr><td>0</td><td>1</td></tr> <tr><td>1</td><td>0</td></tr> </tbody> </table>	A	X	0	1	1	0	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr><th>A</th><th>B</th><th>X</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>1</td></tr> </tbody> </table>	A	B	X	0	0	0	0	1	0	1	0	0	1	1	1	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr><th>A</th><th>B</th><th>X</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>1</td></tr> </tbody> </table>	A	B	X	0	0	0	0	1	1	1	0	1	1	1	1	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr><th>A</th><th>B</th><th>X</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>0</td></tr> </tbody> </table>	A	B	X	0	0	0	0	1	1	1	0	1	1	1	0	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr><th>A</th><th>B</th><th>X</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>0</td></tr> </tbody> </table>	A	B	X	0	0	1	0	1	1	1	0	1	1	1	0	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr><th>A</th><th>B</th><th>X</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>0</td></tr> </tbody> </table>	A	B	X	0	0	1	0	1	0	1	0	0	1	1	0
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Figure 1. Basic Logic Gates.

Figure 1 shows the basic logic gates. Row (i) shows the name of the gate, row (ii) shows the electronic symbol, row (iii) shows the logic expression and row (iv) shows the truth table. A truth table is a table showing all possible values at the inputs of a digital circuit and the corresponding value of the output.

Procedure:

Use MULTISIM or Electronics Workbench (EWB) to solve the following exercises.

Exercise 1:

- (a) Open MULTISIM or Electronics Workbench (EWB) and place the **AND** gate component by clicking on the corresponding gate icon as shown in Figure 2.

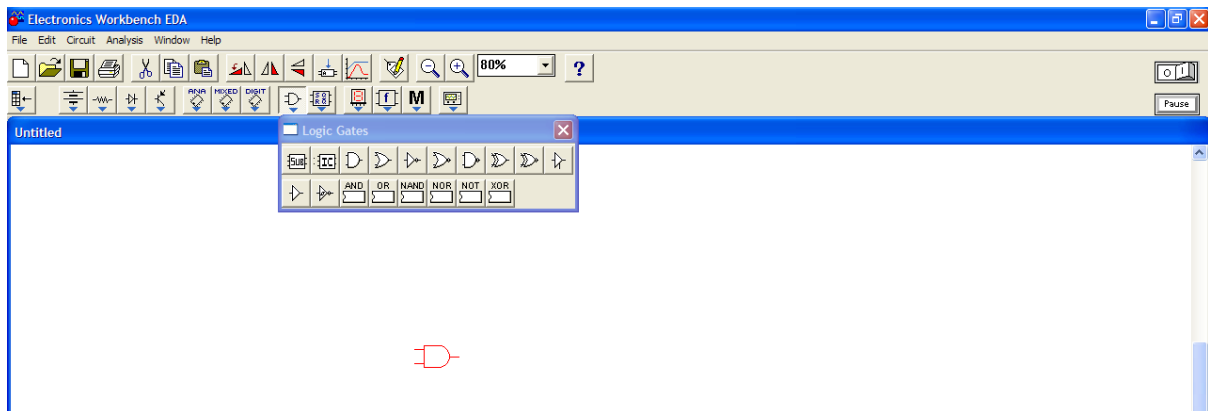


Figure 2. EWB: Placing an AND Gate.

- (b) Use the Word Generator and Logic Analyzer instruments to **complete** Table 1, as shown in Figure 3.

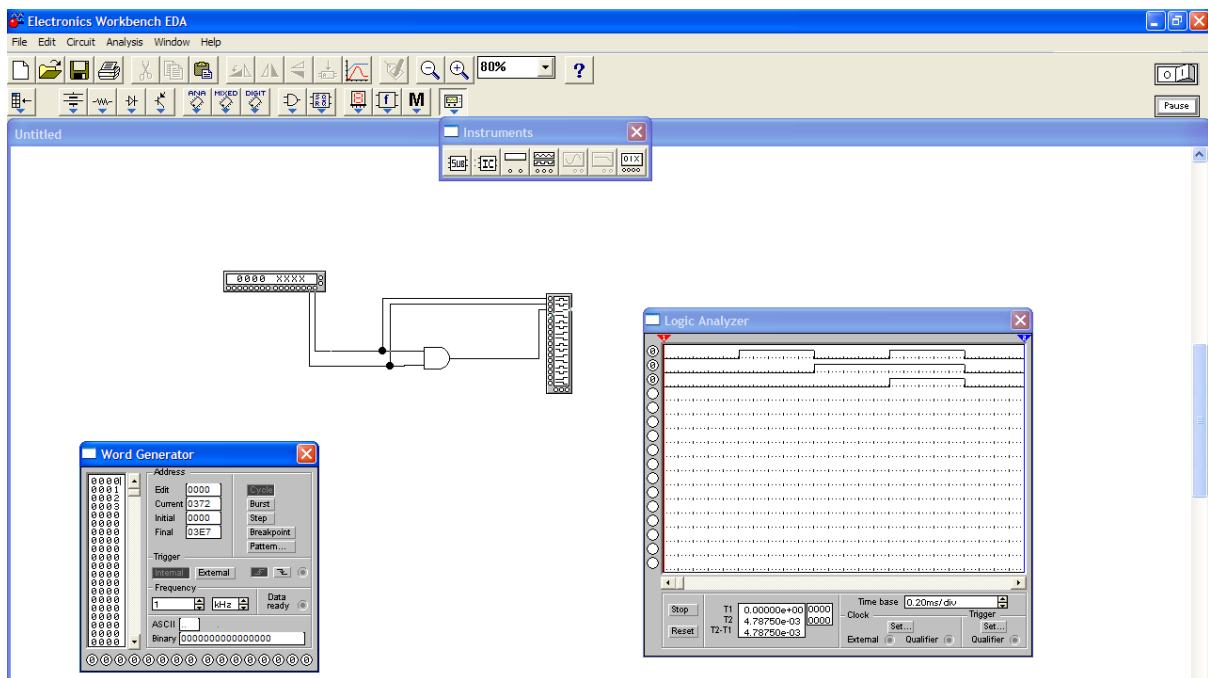


Figure 3. Word Generator and Logic Analyzer Configuration.