Logic Gates

1. Complete the table below by drawing the logic gate symbols. (3)

|  |  |
| --- | --- |
| **Gate** | **Symbol** |
| NOT |  |
| AND |  |
| OR |  |

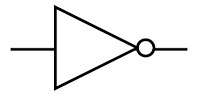
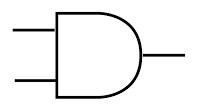
2. Complete the truth table below for a NOT gate. (2)

|  |  |
| --- | --- |
| **INPUT** | **OUTPUT** |
|  |  |
|  |  |

3. Complete the truth table below for an OR gate. (3)

|  |  |  |
| --- | --- | --- |
| **OR** | | |
| **INPUT 1** | **INPUT 2** | **OUTPUT** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

4. Complete the truth table for the logic diagram shown below. (3)



**A**

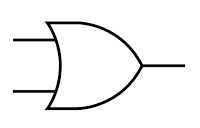
**B**

**X**

**Y**

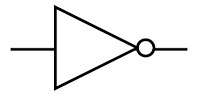
|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **B** | **X** | **Y** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

5. Complete the truth table for the logic diagram shown below. (5)

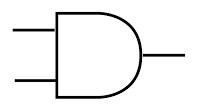


**B**

**C**



**Z**



**Y**

**A**

**X**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **X** | **Y** | **Z** |
|  |  |  |  |  |  |
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|  |  |  |  |  |  |
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|  |  |  |  |  |  |

6. Construct a logic diagram to represent the logic of the scenario below. Use the symbols T, H, V and M. (2)

* A greenhouse climate control system to control the opening of a vent in the roof.
* A temperature (T) sensor is used to monitor the temperature inside the greenhouse.
* A humidity (H) is used to monitor the humidity inside the greenhouse.
* A manual switch (M) is used to manually open the vent.
* The vent (V) is opened is either the temperature (T) or the humidity (H) are outside set limits or if the manual switch (M) has been turned on.

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|  |

7. Construct a logic diagram to represent the logic of the scenario below. Use the symbols W, M, S and A. (3)

* A house has a security system fitted.
* A window (W) is used to detect if any of the windows have been opened.
* A movement sensor (M) is used to detect if there is any movement inside the house.
* The activation switch (S) is used to turn the alarm system on.
* The alarm (A) is sounded if the alarm system is on and either the one of the windows (W) have been opened or movement (M) is detected inside the house.

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