Grade 8 Technology Worksheet

Truth table

1. Explain the following truth tables:

<table>
<tr><th>Table</th><th>Explanation</th></tr>
<tr><td>Truth table
<table>
<tr><th>Input</th><th>Output</th></tr>
<tr><td>0</td><td>1</td></tr>
<tr><td>1</td><td>0</td></tr>
</table>
</td><td></td></tr>
<tr><td>OR gate
<table>
<tr><th>A</th><th>B</th><th>Q</th></tr>
<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>
</table>
</td><td></td></tr>
<tr><td>NOR gate
<table>
<tr><th>A</th><th>B</th><th>Q</th></tr>
<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>
</table>
</td><td></td></tr>
<tr><td>
<table>
<tr><th>A</th><th>B</th><th>Q</th></tr>
<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>
</table>
</td><td></td></tr>
<tr><td>NAND gate
<table>
<tr><th>A</th><th>B</th><th>Q</th></tr>
<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>
</table>
</td><td></td></tr>
</table>

[10 marks]

Grade 8 Technology Worksheet

Suggested Solutions

<table>
<tr><th>Question number</th><th>Possible marks</th><th>Answers</th></tr>
<tr><td>1</td><td>5 x 2 marks</td><td>
<table>
<tr><th>Table</th><th>Explanation</th></tr>
<tr><td>Truth table
<table>
<tr><th>Input</th><th>Output</th></tr>
<tr><td>0</td><td>1</td></tr>
<tr><td>1</td><td>0</td></tr>
</table></td><td>Input high, output low</td></tr>
<tr><td>OR gate
<table>
<tr><td>A</td><td>B</td><td>Q</td></tr>
<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>
</table></td><td>Output is 1 if the input A or B or both are 1</td></tr>
<tr><td>NOR gate
<table>
<tr><td>A</td><td>B</td><td>Q</td></tr>
<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>
</table></td><td>Output is 1 if neither input A nor input B is 1</td></tr>
<tr><td>
<table>
<tr><td>A</td><td>B</td><td>Q</td></tr>
<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>
</table></td><td>Output is 1 if A and B are 1</td></tr>
<tr><td>NAND gate
<table>
<tr><td>A</td><td>B</td><td>Q</td></tr>
<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>
</table></td><td>Output is 1 if input A and input B are not both 1</td></tr>
</table>
</td></tr>
</table>

[10 marks]