***Practical 1: Universal AND logic***

*20‘*

### Apparatus

Digitalexperimenter, I.C. 7408, connecting wires

### Vierfach-AND-GatterMethod

Label the pin’s in circuit 2 with the correct number. Connect the supply to the I.C. at pins 7(0 volts) and 14 (+5 V). With the aid of the connecting wires construct the circuits 1 and 2 and complete the truth table for each.

### Circuit 1

Diagram: Truth table:

|  |  |  |
| --- | --- | --- |
| Input B | Input A | Output |
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

&

**1**

A

**2**

**3**

Output

B

### Circuit 2

Diagram: Truth table:

Output

A

**111**

&

|  |  |  |  |
| --- | --- | --- | --- |
| Input C | Input B | Input A | Output |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |

Output

**44..**

&

B

**33..**

**22..**

C

**..66**

**5.5.**

### Conclusion

The 7408 is a quad two-input AND as it consists of four two-input gates. To design an AND function with 3 input variables we use 2 two-input gates. In a **truth table** for a function **with 3 input variables** are **8 lines** because there are 8 possible combinations of the input variables!