Truth tables up to three inputs

Core BUILD THE BASICS

C1 **State** the number of rows for 2 inputs. **[1]**

C2 **Complete** the A, B, C columns for a 3-input truth table. **[2]**

A	B	C	Z

C3 **Complete** the truth table for a 3-input AND gate. **[1]**

A	B	C	Z
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

C4 **State** the number of rows for 4 inputs. **[1]**

C5 **Complete** the truth table for a 2-input OR gate. **[1]**

A	B	Z
0	0	
0	1	
1	0	
1	1	

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C6 **Complete** the truth table for a 3-input OR gate. **[1]**

A	B	C	Z
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

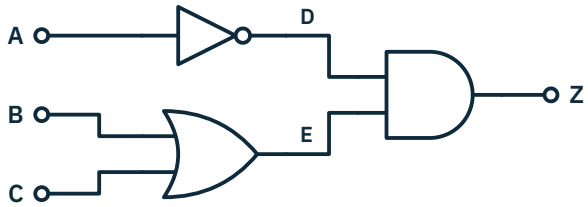
C7 **State** the row(s) where a 3-input AND gives 1. **[1]**

C8 **Complete** the truth table for a NOT gate. **[1]**

A	Z
0	
1	

Stretch GO FURTHER

S1 **Complete** the truth table for $Z = \bar{A} \bullet (B + C)$. **[3]**



A	B	C	D	E	Z
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

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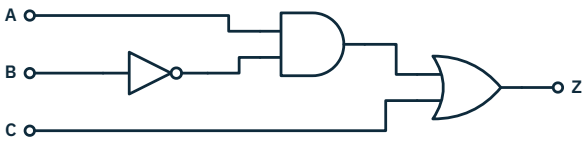
S2 **Complete** the truth table for Z = (A • $\overline{B}$) + C. **[3]**



A	B	C	D	E	Z
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

S3 **Describe** in words when Z = 1 for S2. **[2]**

Exam Ready QUALIFICATIONS SCOTLAND STYLE

E1 A conveyor runs (Z = 1) when the start switch A is on and either guard B or guard C is closed. **Complete** the truth table. **[2]**

A	B	C	Z
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

E2 **Explain** why intermediate columns help when completing a truth table. **[2]**

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E3 A cold-store alarm (Glenmorie, fictional) sounds (Z) when the door is open (D) or the temperature is high (T), and the key switch is off (K = 0). **Complete** the truth table. **[3]**

D	T	K	Z
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

E4 **Explain** why an intermediate column for each gate is useful in a truth table. **[1]**

E5 **State** the number of rows where Z = 1 for E3. **[1]**

Total: 26 marks. Use the Data Booklet. Show your working and give units.