

EXAM QUESTIONS

QUESTION 1

Complete the truth table below for the Boolean statement $p = \text{NOT}(A \text{ AND } B)$.

1			A	B	P
					TRUE
					TRUE

2	1 mark for each correct answer in table.
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QUESTION 2

State the output of each of the following logic circuits for the inputs given.

2	a	<ul style="list-style-type: none"> • 1 • 0. <p>(respectively)</p>	2	<p><u>Examiner's Comments</u></p> <p>Most candidates answered correctly. As expected, some weaker candidates were less able to work with the logic gates in combination</p>
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Fig 1 is a circuit diagram.

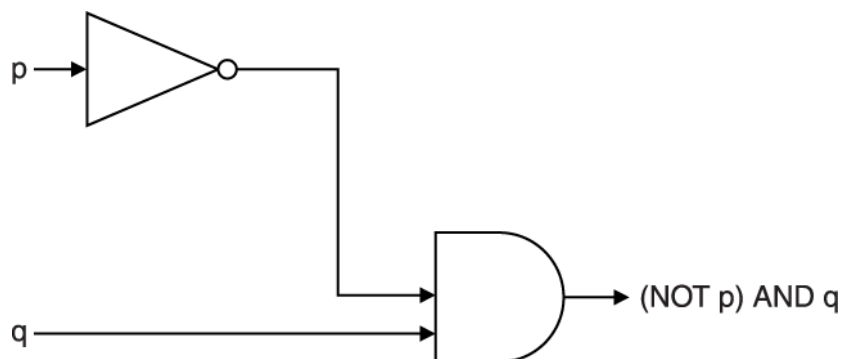


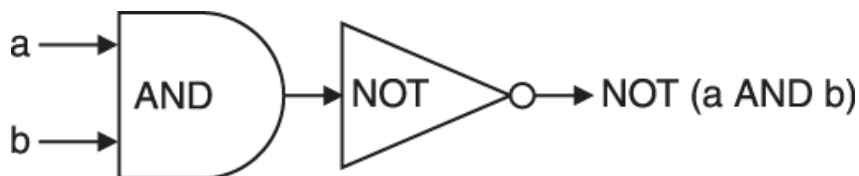
Fig. 1

Complete the truth table for Fig 1.

	b	<p>Correct answer:</p> <table><tr><th>p</th><th>q</th><th>(NOT p) AND q</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table> <p>Award marks for</p> <ul style="list-style-type: none">• Correct missing input cases (0 1, 1 1 or 1 1, 0 1)• Output of 1 for 0 1• Output of 0 for 1 1.	p	q	(NOT p) AND q	0	0	0	1	0	0	0	1	1	1	1	0	3	<p><u>Examiner's Comments</u></p> <p>As expected, some weaker candidates were less able to work with the logic gates in combination</p>
p	q	(NOT p) AND q																	
0	0	0																	
1	0	0																	
0	1	1																	
1	1	0																	

QUESTION 3

The following logic diagram shows the expression **NOT (a AND b)**.



Complete the missing boxes in the truth table below to show the value of NOT (a AND b) that will be output for each possible set of values of a and b.

3				<table><tr><th>A</th><th>b</th><th>NOT(a AND b)</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>	A	b	NOT(a AND b)	0	0	1	0	1	1	1	0	1	1	1	0	4	<p>No follow through on row 4.</p> <p><u>Examiner's Comments</u></p> <p>This part was well answered by the majority of candidates, indicating that logic and truth tables – a core concept in computer science – is understood by most candidates.</p>
				A	b	NOT(a AND b)															
				0	0	1															
				0	1	1															
				1	0	1															
1	1	0																			

1 mark for row two and three. For row 4, 1 mark for correctly identifying 1 1 as the inputs, and 1 mark for the correct output 0)