

Revision Sheet

IGCSE Computer Science · Unit 10 Boolean logic

6 vocabulary items · 27 marks of exam questions (5 questions)

Part 1 · Vocabulary review (6 items). The terms this unit is examined on most. Mark it yourself from the answer key.

Section A · Chinese to English

Write the English word.

1.

[1]
2.

[1]
3.

[1]
4.

[1]
5.

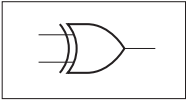
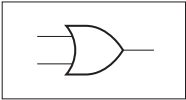
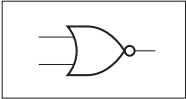
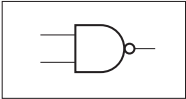
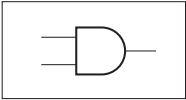
[1]
6.

[1]

Part 2 · Exam questions (27 marks, 5 questions) begins on the next page. They are ordered easy to difficult and none of them has been set before.

7 Four logic gates and five logic gate symbols are shown.

Draw one line to link each logic gate to its correct symbol. Not all logic gate symbols will be used.

Logic gate	Logic gate symbol
AND	
NAND	
NOR	
XOR	
	

8 A logic circuit is to be built to control the automatic opening of a window. The window **W** opens if the temperature **T** is too high, the heater **H** is off, and the air conditioning **A** is off.

air conditioning A	air conditioning off	0
	air conditioning on	1
temperature T	not too high	0
	too high	1
heater H	heater off	0
	heater on	1
window W	window closed	0
	window open	1

Complete the truth table for this problem.

A	T	H	W
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

9 Consider this logic expression.

$X = (A \text{ OR } B) \text{ AND } (\text{NOT } B \text{ AND } C)$

Complete the truth table for this logic expression.

A	B	C	Working space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

10 A logic circuit is to be built to control the opening of a safe used to store money. There are two keys, **A** and **B**, and a time switch **C**. The safe can only open if both keys are used and the time switch is off.

key A	not used	0
	used	1
key B	not used	0
	used	1
time switch C	switch off	0
	switch on	1
safe X	safe cannot open	0
	safe can open	1

(a) Write the logic expression for this problem.

..... [3]

(b) Complete the truth table for this problem.

A	B	C	Working space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

11 (a) Draw the symbol for an XOR logic gate **and** complete the truth table for it.

XOR logic gate symbol:



Truth table:

A	B	X
0	0	
0	1	
1	0	
1	1	

[2]

(b) Consider the logic rules in the following table:

Input	Binary value	Description
A	0	operator not present
	1	operator present
B	0	ignition key present
	1	ignition key not present
C	0	operator code correct
	1	operator code not correct

A crane is a machine with a long arm used to lift heavy objects. The crane will only move:

- if the operator is present and
- either the ignition key is present, or the operator code is correct.

The crane moving is represented by **X = 1**.

(i) Write the logic expression for the crane moving.

X = [2]

(ii) Complete the truth table for the crane moving.

A	B	C	Working space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		