

SURNAME: Scott

FORENAME(S): Benjamin

12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

List the numbers of the questions you have attempted	Office Use
1	8
2	5+1
3	2
4	2
5	2
6	0
	19/20
	+2
	40%
Total	20/20

(Gweler yr ochr arall am y fersiwn Cymraeg)

- 1) a) Return - Means Return.
Returns from any functions or delays to original Code and continues running ✓
- b) Sleep - Means Sleep
adds a pause or delay in the circuit and stops code like an interrupt -
- c) ADDLW - Means Add Literal to W register
takes the values stored in the literal and sums with the W register ✓
- d) BCF - Bit Clear F
Clears the bits that are stored in F ✓
- e) DecF - Means decrement F
decrements or decreases the value stored in F by 1 ✓

1 1/2
1 1/2

1 1

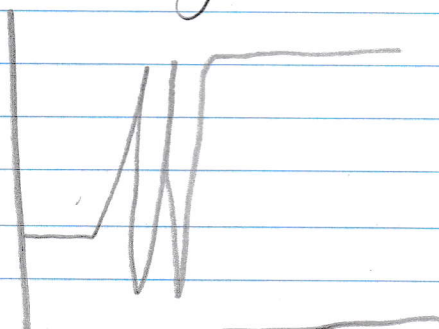
2
2

1 1/2
1 1/2

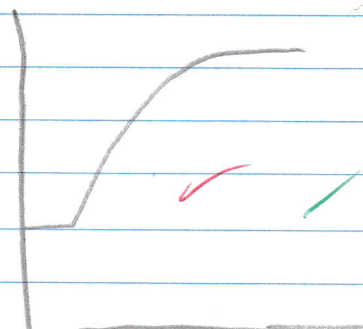
2
2

8

- 2) Switch bounce can be reduced by using a capacitor in the circuit to reduce any alternating inputs. The input from the switch will go into the capacitor and be evenly discharged into the circuit ✓



Switch bounce
no capacitor

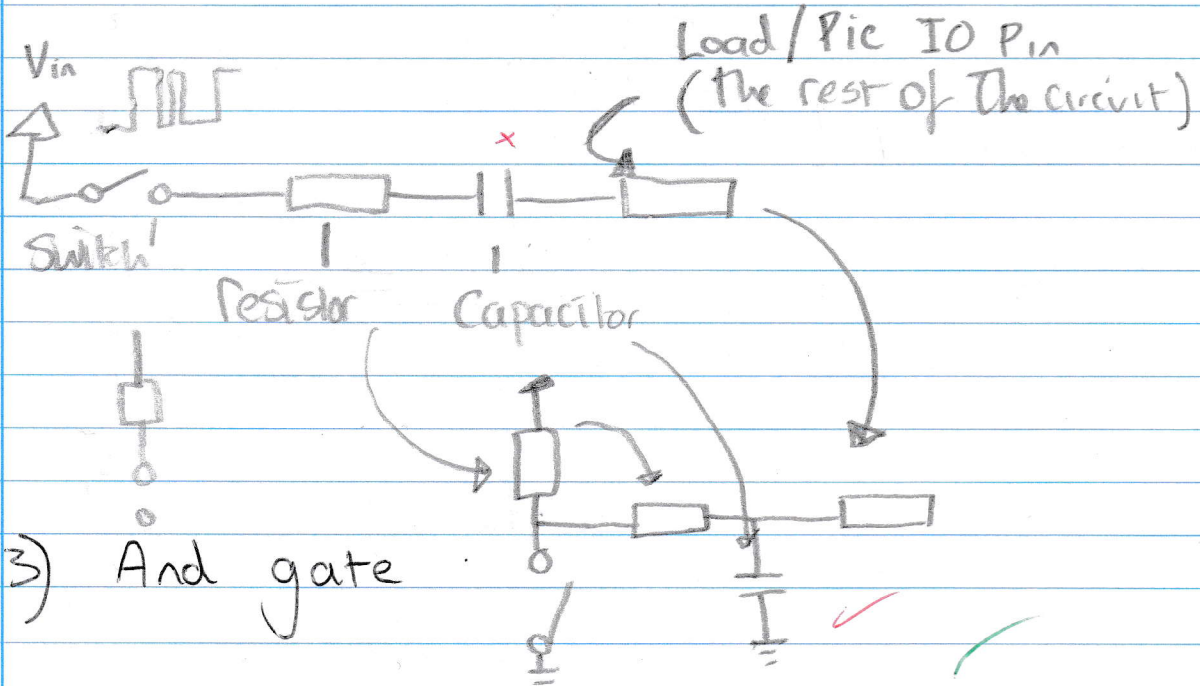


Switch bounce
with capacitor

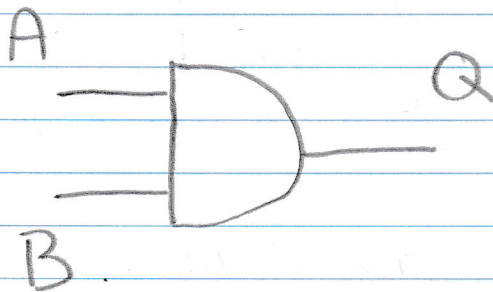
1

1

The circuit that a capacitor may be used in may look something similar to the circuits below



A	B	Q
0	0	1
0	1	0
1	0	0
1	1	1



4) a)

A	B	C	D	E	F	J	Q
0	0	0	1	1	0	0	1
0	0	1	1	0	1	1	1
0	1	0	1	0	0	1	0
1	0	0	0	1	0	1	0
1	0	1	0	0	1	0	0
1	1	0	0	0	0	0	1
1	1	1	0	1	1	1	1

Circuit on page 5

Not gate

A	Q
0	1
1	0



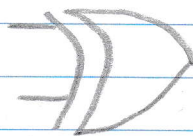
Nor gate

A	B	Q
0	0	1
0	1	0
1	0	0
1	1	0



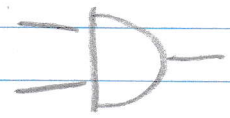
Xor gate

A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0



And gate

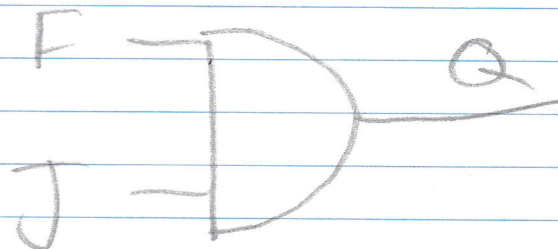
A	B	Q
0	0	0
0	1	0
1	0	0
1	1	1



b)

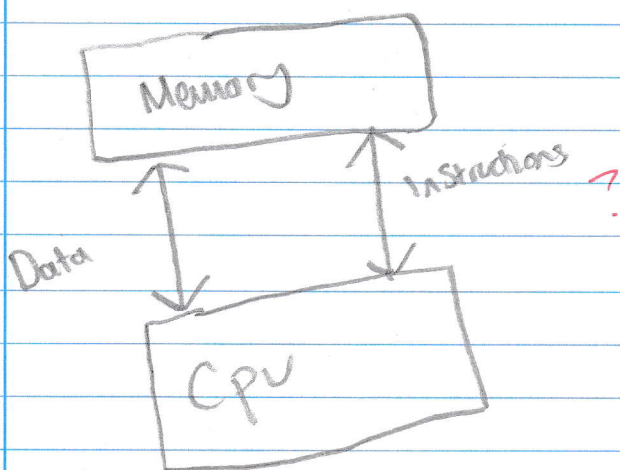
F	J	Q
0	0	1
0	1	0
1	0	0
1	1	1

and gate



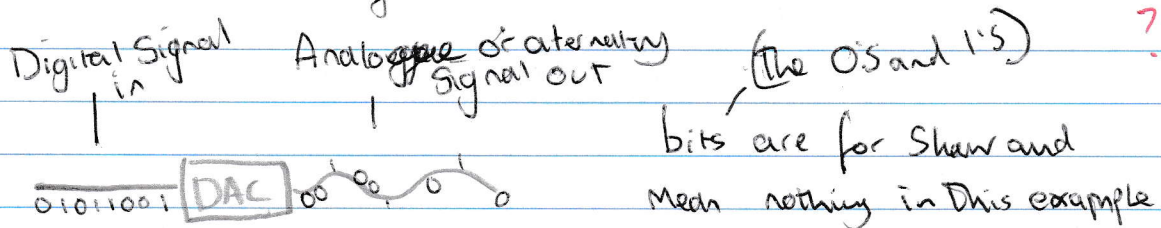
5)

Neumann ~~Von Neumann~~	Harvard
Cheaper to design / manufacture ✓	Single busses for Data and Instructions
Used for less complex Systems. i.e. Computer CPUs, ✓	Can do multiple processes at the same time ✓
	faster ✓



6)

When you put a digital signal into a digital to analogue converter the signal at the input goes from direct to alternating. ?
This means at the microcontroller it can generate a pulse width modulation signal to be able to carry out its intended function.



4) (Continued)

below is the diagram of the circuit and the corresponding outputs

