



Complete, fold and seal
(see note 2 below)

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Examination Answer Books

12 Pages

Instructions to Candidates

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.

1	Student Number	230 7075
2	Title of Examination Paper	Micros Peripherals and interfaces
3	Module Code	ACDA4004
4	Date and Time of Examination	0900 08/01/25
5	Examination Venue	1Q 310
6	Seat Number	008
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
1	5
2	1
3	3
4	7
5	8
6	0
	24
Total	48%

5
1
3
7
8
0
24.

1 - stands for return

a) RETURN - returns the code to a set point, usually the main loop.
- stands for sleep

b) SLEEP - Means the PIC will go into sleep or standby mode.

c) ADDLW - stands for add literal and W - add the literal and W values together

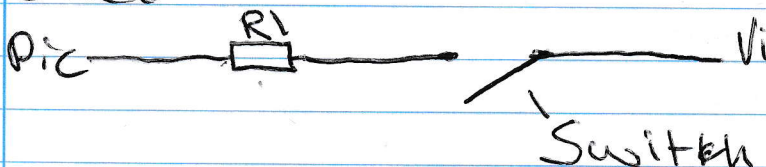
d) BCF f, b - Bit Count f - b
bit count the bits from f to b.

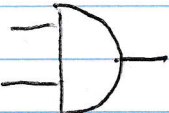
e) DECF - decrement f - Make F go down in set stages or decrements.

a)

To solve switch bounce on a I/O pin a small circuit with capacitors can be used to mitigate switch bounce.

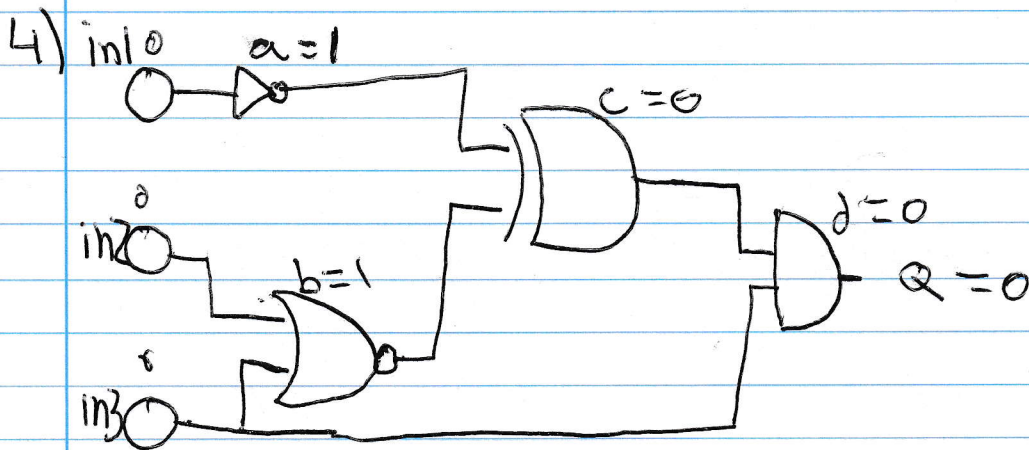
Alternatively a step up or step down resistor can be used.



3)  AND gate

truth table

A	B	output
0	0	0
0	1	0
1	0	0
1	1	1



$a = \text{NOT} - \text{inverts}$ $\text{in1} = 0$
 $\text{in1} \mid \text{out}$ $a = 1$

0	1
1	0

$b = \text{NOR}$

in1	in2	out
0	0	1
0	1	0
1	0	0
1	1	0

$\text{in2} = 0$
 $\text{in3} = 0$
 $b = 1$

c) = XOR

in1	in2	out
0	0	0
0	1	1
1	0	1
1	1	0

in1 = 0
in2 = 1
C = 0

in1	in2	in3	out
0	0	1	1

D = AND

in1	in2	out
0	0	0
0	1	0
1	0	0
1	1	1

in1 = 0
in2 = 0
D = 0

output = 0

truth table

	in1	in2	in3	out
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	1	0
5	0	1	1	1
6	0	0	1	0
7	0	1	0	0

NOT
1) 0-1-2-3-4-5-6-7
0-1-2-3-4-5-6-7
0-1-2-3-4-5-6-7

AND gate
needs 1 and 1
but as the original
3rd input is 0
it won't work

2) 3rd input is set to 0 therefore AND gate will not show 1

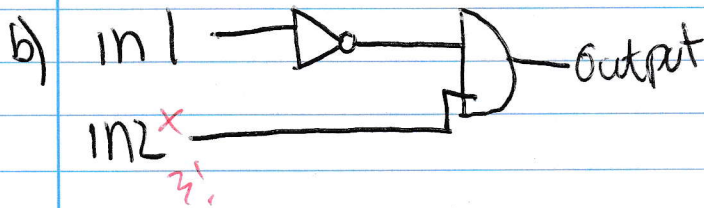
3) 3rd input is set to 0 AND gate will be 0 for all

4) as the NOT and NOR gates will be 0 AND gate will be 0

4 NOT and NOR gates will be 0 therefore AND = 0

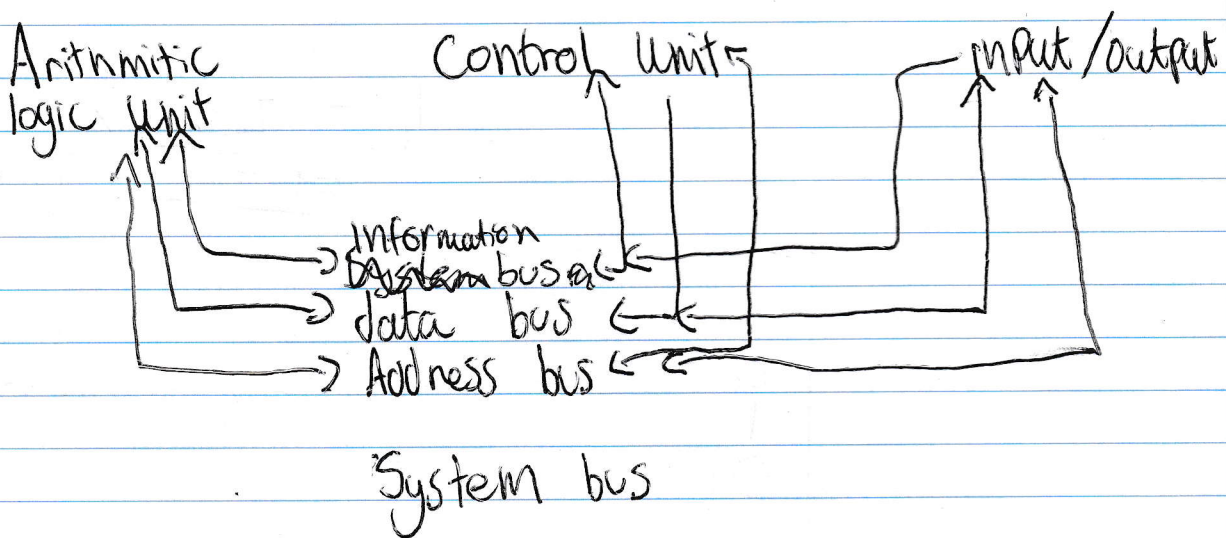
5 As NOT gate will be 1 and NOR gate 0 XOR will be 1 and AND will display 1 as 3rd input is 1

6 As NOR gate is on 0 and NOT gate on 1 XOR is 1 and so AND making output = 1



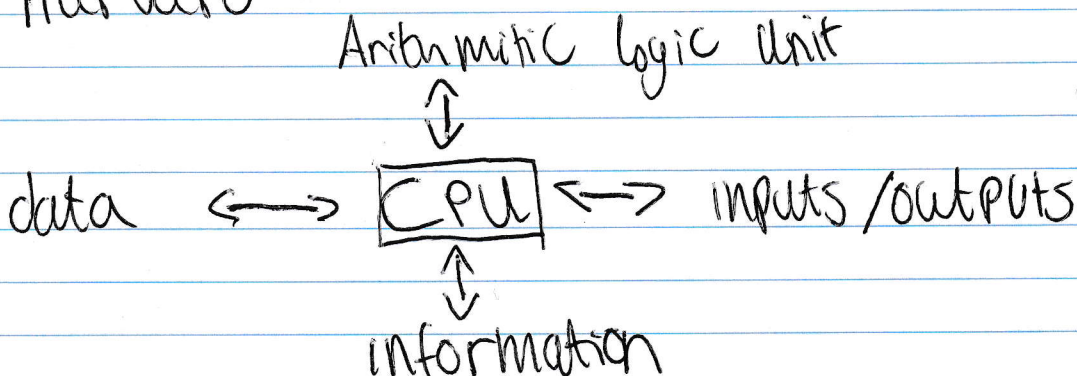
2

5) Von Neumann



3

Harvard

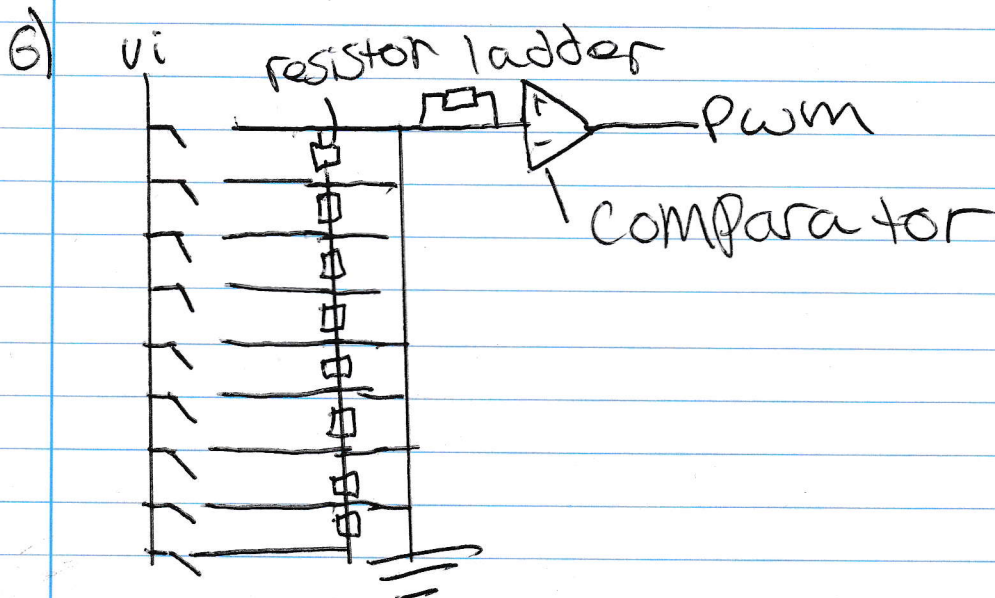


3

3

- Von Neuman advantage over Harvard
- less components than Harvard
 - less space wasted than Harvard
 - cheaper than Harvard.

- Harvard advantage over Von Neumann
- faster processing compared to Von Neumann
 - easier to control compared to Von Neumann
 - Modern compared to Von Neumann



the comparator compares reference voltage in to voltage out of the closed switches and then outputs an analog signal accordingly.