

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.**

**Complete, fold and seal
(see note 2 below)**

SURNAME: Creed

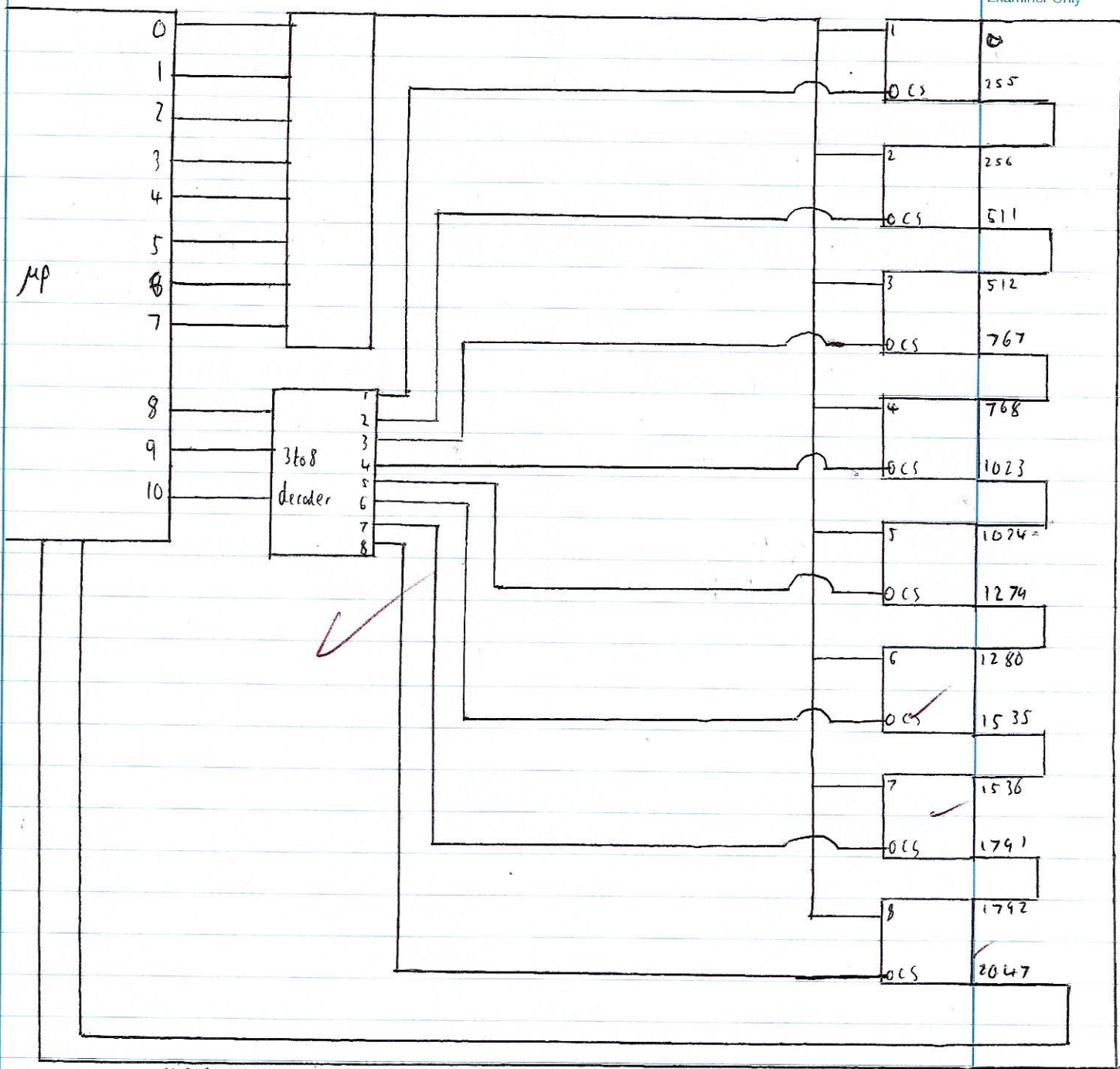
FORENAME(S): *Aneirin*

1	Student Number	1809249/1
2	Title of Examination Paper	micros peripherals and Interfaces
3	Module Code	TBA
4	Date and Time of Examination	8/5/19 PM
5	Examination Venue	Hall
6	Seat Number	
7	Number of Answer Books handed in	

[illegible]

52% ✓

4 a



MP, pins				chips							
10	10	9	8	8	7	6	5	4	3	2	1
1	0	0	0	1	1	1	1	1	1	1	0
2	0	0	1	1	1	1	1	1	1	0	1
3	0	1	0	1	1	1	1	1	0	1	1
4	0	1	1	1	1	1	1	0	1	1	1
5	1	0	0	1	1	1	0	1	1	1	1
6	1	0	1	1	1	0	1	1	1	1	1
7	1	1	0	1	0	1	1	1	1	1	1
8	1	1	1	0	1	1	1	1	1	1	1

3 to 8 decoder.

4. ✓

2 ✓

4b) memory location 875

There are 8 chips
each chip has 255 location

10 9 8										
			8	7	6	5	4	3	2	1
1024	512	256	128	64	32	16	8	4	2	1
0	1	1	0	1	1	0	1	0	1	1

011 → chip select 4 ✓

01101011 → location 107 ✓

memory location for 875

is chip 4 location 107 ✓

1 a) Post 1 equ OE W F

;

MOV LW 0x58	58	
MOV WF POST1	58	58
MOV LW 0x3A	3A	58
ADD WF POST1	3A	+ 58

3A → 0011 1010
 58 → 0101 1000

 0: 1001 0010 ✓

memory location OE ;

1001 0010
 9 2

Z C DC
 0 0 1 ✓

3 ✓

1b) Data 1 equ 0x14 W F

;

MOV LW 0x5A 5A

MOV WF Data1 5A 5A

RLF Data1

INCF Data1

RLF Data1

INCF Data1

5A → 0:0101 1010

RLF 0:1011 0100

INCF 0:1011 0101

RLF 1:0110 1010 Z C

INCF 1:0110 1011 0 1

6 B ✓

memory location 14, 6B Carry C=1 ✓

c)

~~Count~~

Count1 equ 0x17

MOV LW 0x05 ✓

MOVWF Count1 ✓

LOOP

CALL Delay1 ✓

DECFSZ Count1 ✓

GOTO LOOP ✓

NOP

NOP ✓

4 ✓

- 2b) A Subroutine can be utilised in many different ways. One way a subroutine can be used is to run a section of code repeatedly. For example a Delay subroutine. Instead of repeating multiple lines of code, calling the same routine would save time and processor memory. A subroutine can only be activated if it has already been sequentially nested within the code. Once the Subroutine has run through the program will continue (RETURN) to the next steps after the Subroutine in the initial code.

An Interrupt routine like a subroutine uses ~~predetermined~~ separate code within the main body to perform a sequence. However, unlike a subroutine an interrupt can commence at any point during the run of a program. The trigger of an interrupt can commence through either hardware or software. For example a push button at traffic lights will interrupt the sequence and start a new command.

~~In comparison:~~
~~Subroutines must be written in place.~~
~~Interrupt can fire whenever.~~
~~Subroutines are preplanned and tested.~~
~~Interrupt can cause system errors if fired at the wrong time.~~

- c) To ensure a program resumes operation in a correct state following an interrupt the syntax RETFIE ✓ must be used and in the correct location you wish the program to return. ✓

5a) RS 232 uses serial connections ~~also~~
SPI does not use serial connections. (It uses parallel)

ii) ~~An initial bit~~
An initialising bit will be sent that is followed by a + ~~1~~ 7 bit message.

ii) An end bit follows the 7 bit message to end the + data.

iii) The slave and master share ~~many~~ ^{many} connections of which ~~one~~ is a connection the confirms ~~that~~ the either device is ready to send or receive.

iv) 5 0 0 1 1 0 0 1 1 1 0 1 0 1 1

x