



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, **complete** the box and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can only read legible 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:

Regan

FORENAME(S):

Nicholas

James

1	Student Number	1803871
2	Title of Examination Paper	Men's peripherals & interfaces
3	Module Code	ACDA4004
4	Date and Time of Examination	20/5/19 15:00
5	Examination Venue	IQ 310
6	Seat Number	G018
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
1	8 1/2
2	2
3	2
4	8
5	5
6	4
7	4
Total	~~33 1/2~~ 33.5

8.5
2
2
8
5
4
4

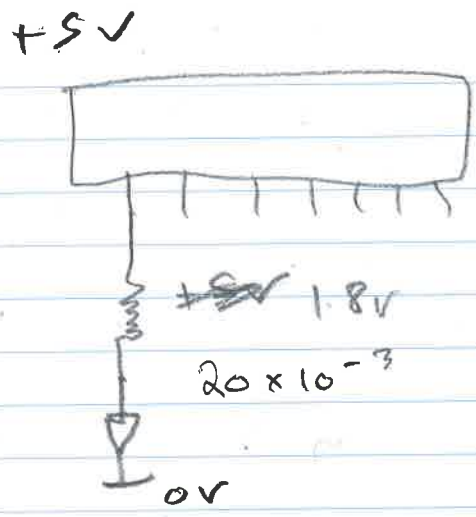
67%

67%

1.1

- 1)
- a) CLRF - clear register file ✓
 - clear all bits to zero (2) 2
- b) BTSS - Bit Test & Set Skip ✓
 - test bit at bit register & Set (1)
 Skip over next instruction (2) 2
- c) Return - return to instruction identified (label) ✓
 (1 1/2) 1.5
- d) MOVLW - move literal working ✓
 - load w to register (1 1/2) 1.5
- e) INCF - increment single bit to value 1 (1 1/2) 1.5

2)



$$R = \frac{V}{I} = \frac{3.2}{20 \times 10^{-3}} = 160 \Omega$$

2

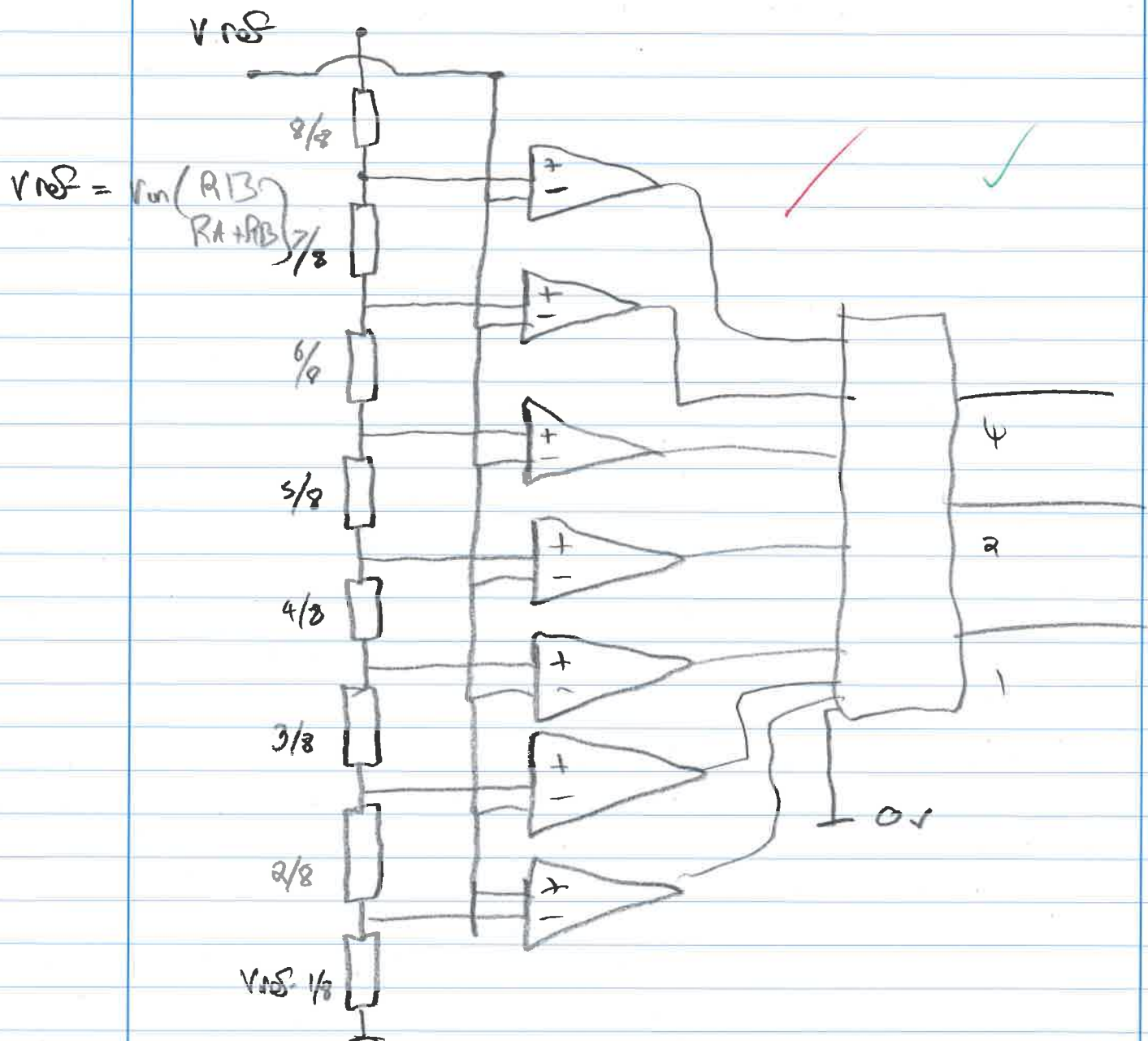
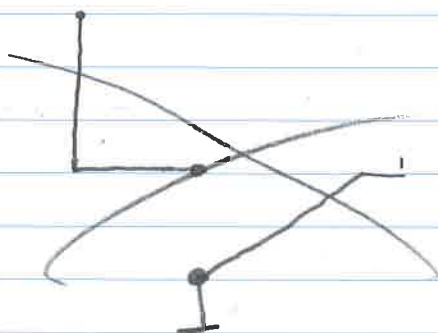
2

3) Sink goes in and Source goes out ✓

2

2

4)





- 1.
- * Flash ADC are quick as all comparators are operating at the same time ✓
 - * They need a lot of comparators. For example 8 bit need 255 comparators. ✓

The voltage travels through the comparators and into the encoder as all resistors and comparators then all pins are in use where as if only 7 resistors and 6 comparators were connected only the 4 way and 2 way pin would be in use. ✓

8

8

5) a) $0110 \quad 0111 = \underline{67}$ ✓

	8	4	2	1	8	4	2	1
	0	1	1	0	0	1	1	1

b) $1001 \quad 1011 = \underline{9B}$ ✓

	8	4	2	1	8	4	2	1
	1	0	0	1	1	0	1	1

c) $1110 \quad 1010 = \underline{EA}$ ✓

	8	4	2	1	8	4	2	1
	1	1	1	0	1	0	1	0

d) $0010 \quad 1100 = \underline{2C}$ ✓

	8	4	2	1	8	4	2	1
	0	0	1	0	1	1	0	0

e) $1011 \quad 1000 = \underline{B8}$ ✓

	8	4	2	1	8	4	2	1
	1	0	1	1	1	0	0	0

b)

a) $237 = \underline{1101101}$ ✓

128	64	32	16	8	4	2	1
✓	✓		✓		✓		

$$\begin{array}{r} 128 \\ 109 \\ \hline \end{array}$$

64

45

32

13

8

5

4

1

b) $128 = \underline{01111101}$ 128 64 32 16 8 4 2 1
64 1 1 1 1 1 0
61
32
29
16
13
5
4

(1)

c) $198 = \underline{11000110}$ 128 64 32 16 8 4 2 1
128 1 1 0 0 0 1 1 0
070
64
6

(1)

d) $247 = \underline{11110110}$ 128 64 32 16 8 4 2 1
128 1 1 1 1 0 1 1 0
128
64
55
32
22

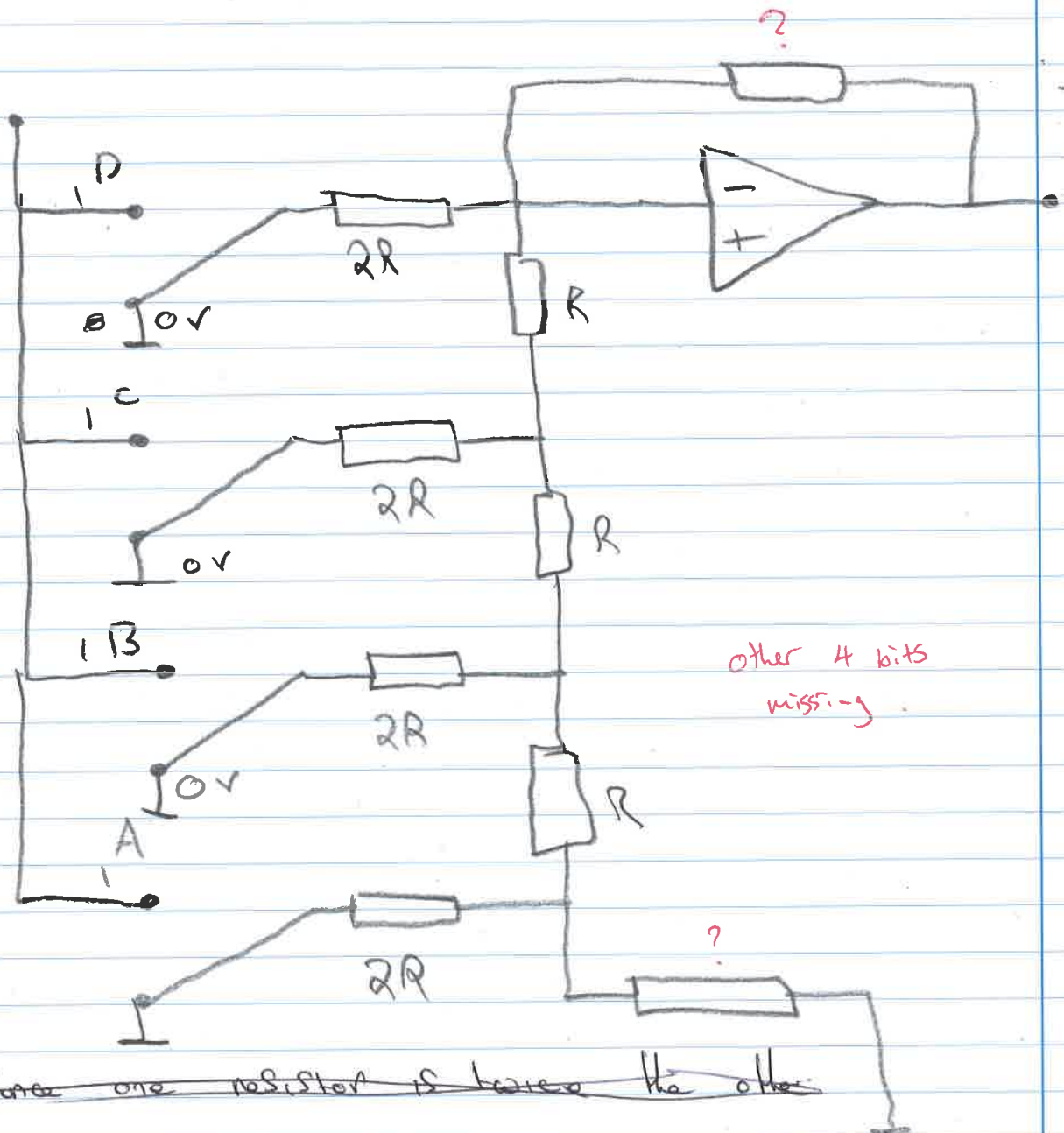
X

e) ~~$312 =$~~ 128 64 32 16 8
~~128 1 1 1 1~~
~~128~~
~~64~~
~~120~~
~~88~~
~~72~~

$312 = 256$ 128 64 32 16 8
1 0 0 1 1 1
4
1
2e at end

312
256
112
62
56
32
24
16
12
6

7)



- ~~Since one resistor is twice the other~~

Since one resistor is twice the other this is called a R-2R ladder ✓

- They don't require a large range of resistor values ✓
- They always use between 0-8V

to work out the voltage on a R-2R ladder its $V_D = \frac{V_C}{2} + \frac{V_B}{4} + \frac{V_A}{8}$ ~~X~~

$$V_{out} = - \left[V_{D7} + \frac{V_{D6}}{2} + \frac{V_{D5}}{4} + \frac{V_{D4}}{8} + \frac{V_{D3}}{16} + \frac{V_{D2}}{32} + \frac{V_{D1}}{64} + \frac{V_{D0}}{128} \right]$$

(4)

(4)

6)
2)

$$\begin{array}{r}
 312 \\
 \underline{256} \\
 56 \\
 32 \\
 24 \\
 8
 \end{array}$$

$$\begin{array}{cccccccc}
 256 & 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\
 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0
 \end{array}$$

$$312 = \underline{100111000}$$

1