

NOTE: Use of internet is not permitted, calculators are permitted and your answers must include worked solutions. If you require extra sheet(s) please write your name and student number at the top of each additional sheet.

### Objective

Complete exam questions d, e, and f below

- (d) Detail the computations for subtracting the numbers below in binary utilising 8-bit complimentary addition
- $$32 - 16_{10}$$

(8 marks)

- (e) Convert hexadecimal number which is a hexadecimal representation of an IEEE Single Precision Floating Point number.

$$C0\ 48\ 00\ 00_{16} \equiv \text{Decimal}_{10}$$

(8 marks)

- (f) Given that the ASCII value for 'A' is  $41_{16}$ , Space is  $20_{16}$  and 'a' is  $61_{16}$  convert the hexadecimal string below into a string

$$48\ 61\ 6E\ 20\ 53\ 6F\ 6C\ 6F \equiv \text{string}_{char}$$

(6 marks)

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Qd  $32 - 16_{10}$

	$2^0$	$2^1$	$2^2$	$2^3$	$2^4$	$2^5$	$2^6$	$2^7$
	1	2	4	8	16	32	64	128
32	0	0	0	0	0	1	0	0
16	0	0	0	0	1	0	0	0

$32 = 00100000$

$16 = 00010000$

subtract 1

Now add

00100000	00010000
+ 11110000	00000001
<u>100010000</u>	<u>00001111</u>

Overflow

answer

00010000

flip

11110000

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Ge CO 48 00 00<sub>16</sub>

C 0 4 8 0 0 0 0  
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓  
 100 0100 0000 0000 0000 0000  
 0000 1000 0000 0000

4 pairs of hexadecimal

$$1 \times 2^{-4} - 1 \times$$

Exponent ⑪

$$11 + 127 = 138$$

10001010

$11 + 127 = 138$   
 $10001010 \rightarrow 2^{11} = \text{C.00048828125}$

C.0004882 P125



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Calculate Mantissa

Qe

[illegible]

mantissa | ~~mantissa~~

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$$Q_e = -1 \times 2^{-1} \times 10^1 = 0.00048828125$$

Qf 48 61 6E 20 53 6f 6C 6f  
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓  
H a n S o l e

space

Hand up this practical report at the end of session and ensure it has been checked

Student Name	Huu Chi Huynh	Student Number	C00261172
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<b>Date</b>	<b>10/11/2021</b>	<b>Checked</b>	
<b>Group</b>	<b>A</b>		