Full Name: _____

Lab Section: A (F12-15) B (Tu18-21) C (W11-14)
D (Th9-12) E (F15-18)

Signature: _____   UBC Student #: └─┴─┴─┴─┴─┴─┴─┴─┘

Important notes about this examination

1. **This examination has 3 double-sided pages. Check that you have a complete paper.**
2. This is a closed book, closed notes exam. No books or other material may be used. Answer all the questions on this paper.
3. Give very **short but precise** answers. State any assumptions you make
4. Work fast and do the easy questions first. Leave some time to review your exam at the end.
5. You have 50 minutes to complete this exam. Good luck!

Please do not write in this space:

Problem 0: └─┴─┘

Problem 1: └─┴─┘

Problem 2: └─┴─┘

Problem 3: └─┴─┘

Problem 4: └─┴─┘

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Problem 1: Multiple Choice – circle the correct answer [4 marks]

i. How many symbols can be represented by four bits?

   a. 12

   b. 16

   c. 36

   d. 256

ii. On the computer, variables are

   a. memory locations

   b. programs

   c. files

   d. all of the above

iii. In JavaScript, **onclick** is a(n)

   a. variable

   b. event

   c. event handler

   d. button

iv. Suppose you have an image saved in a vector representation. The size of the vector graphics file depends on the size of the image.

   a. true

   b. false

Problem 2: Understand JavaScript Function [9 marks]

Find values of a, b, c, d, e, f, g, h, i. List them in the table to the right.

```
a = 1 + 1;
b = 2 * (a - 1);
c = a + b;
d = c;
e = foo(d,b)
f = 10;
g = bar(f,d);
h = baz(f,d);
i = foo(baz(1,1),bar(a,b));

function foo(x,y) {
      return x + y;
}

function bar(w,z) {
      return 2 * foo(w,z);
}

function baz(q,r) {
      return bar(q,r) + foo(q,r);
}
```

a	
b	
c	
d	
e	
f	
g	
h	
i	

Problem 3: Write JavaScript Function [7 marks]

Complete the following function that takes a number "n", and returns the average of the numbers from 1 to n.
Example: averageN(5) returns (1+2+3+4+5)/5 = 3

```
function averageN(n) {
```

Problem 4: Translation between binary, hexadecimal, and decimal [10 marks]

(a) Translate the following decimal number to its binary equivalent. SHOW YOUR WORK.
   42

(b) Translate the following hexadecimal number to its binary equivalent. SHOW YOUR WORK.
   FACE1

Appendix: HTML, JavaScript, Binary and Hexadecimal digits

Summary of some common HTML tags:

Start Tag	End Tag	Meaning
`<html>`	`</html>`	HTML document; first and last tags in an HTML file
`<title>`	`</title>`	title bar text; describes page
`<head>`	`</head>`	preliminary material at start of the page
`<body>`	`</body>`	the main part of the page
`<p>`	`</p>`	paragraph, can use `align` attribute
`<script>`	`</script>`	Start a script. By default this is JavaScript
`<!--`	`-->`	HTML comment (not really a tag); ignored by the browser

Summary of some common JavaScript syntax

```
var foo = 42;//create a variable named foo
```
```
if (<Boolean expression>)
   <then-statement>
else
   <else-statement>
```
```
function <function name>(<parameters>)
{
    <function body>
}
```
```
for (<initialization>; <continuation>; <next iteration>){
   <statement list>
}
```

Powers of two

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

Hexadecimal digits

Binary representation	Decimal representation	Hexadecimal representation
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	10	A
1011	11	B
1100	12	C
1101	13	D
1110	14	E
1111	15	F