MEMORIAL UNIVERSITY

Department of Electrical and Computer Engineering
Faculty of Engineering and Applied Science

Name: _____
Student ID: _____

ENGI1000: Exam Writing

Final exam

Question	Points	Score
1	4	
2	4	
3	3	
4	2	
5	0	
Total:	13	

Instructions

1. This is a closed-book exam: written aids are not permitted.
2. Calculators, phones and all other electronic aids are forbidden.

In which questions varied and sundry are asked

1. Explain the differences between: [4]

   (a) Pointers vs references 2

   > **Solution:** A pointer is a number, a location in memory, so it must be *dereferenced* to access a value. A reference can be treated just like the thing it references.

   (b) `static_cast` vs `dynamic_cast` 2

   > **Solution:** The compiler has all information required to do a `static_cast` at compiler time, whereas a `dynamic_cast` requires run-time information.

2. Define the following terms. [4]

   (a) Expression 2

   > **Solution:** Something that can be evaluated

   (b) Abstract class 2

   > **Solution:** A class with at least one unimplemented method

In which the student is subjected to further examination

3. What is the correct C++ syntax for: [3]

   (a) Declaring a move assignment operator within class `Foo`? 1

   - ◯ `operator = (Foo&);`
   - ◯ `operator = (const Foo&);`
   - √ **`operator = (Foo&&);`**
   - ◯ `operator = (const Foo&&);`

   (b) Creating a subclass of `class Parent`? 1

   - √ **`class Child : public Parent {};`**
   - ◯ `class Child : override Parent {};`
   - ◯ `class Child : subclass Parent {};`
   - ◯ `class Child : virtual Parent {};`

   (c) Defining a lambda function that increments an integer parameter? 1

   - ◯ `[]() { return x + 1; }`
   - ◯ `[x]() { return x + 1; }`
   - ◯ `[x](int x) { return x + 1; }`
   - √ **`[](int x) { return x + 1; }`**

4. What is invalid about each of the following? How could you fix it? [2]

   (a) Casting a `Car*` to a `Subaru*`: 2

```
class Car { /* ... */ };
class Subaru : public Car { /* ... */ };
Car *car = /* ... */;
Subaru *s = car;
```

   > **Solution:** The `Car` might not be a `Subaru`. Use `dynamic_cast` to check.

Bonus questions

5. (a) What is the simplest possible lambda function? 1 (bonus)

Solution: `[](){}`