ECE150 Fall 2018 (Sections 001 and 002)

Assignment 1

Due: Friday September 14, 2018

1. Write a C++ program that prints out the following text. Fill in the [—] with the course number.

```
My favourite course after week 1 is [-].
```

2. Compile the "Hello World!" program that was presented in class without the #include <iostream> statement. State the error message the compiler reports. Please explain what the compiler is trying to indicate to you?

3. Using the incomplete source code below, write a function declaration called days_in_week, which prints to the console the number of days in a week.

```
#include <iostream>

int main();

// Write the declaration here.

int days_in_week() {
  std::cout << "7 days in a week.";
  std::cout << std::endl;
  return 0;
}

int main() {
  std::cout << "Hello world";
  std::cout << std::endl;
  days_in_week();
  return 0;
}
```

4. Suppose you have a program with the following block of five statements as shown below. State the order in which these statements will be executed.

```
statement_2();
statement_1();
statement_4();
statement_3();
statement_5();
```

5. State the difference between a function declaration and function definition.

6. There are five categories of literal data. Give an example for each one.

7. Write a C++ program to print to the console the following string: `\\'"`

8. Explain what portability issues does the `std::endl` solve?

9. Write a program to print to the console the following matrix such that each row is printed on a new line, and each entry in a row is separated by a tab.

A	1	\
Hgah	3	150
“x”	b	D

10. Can you use keyword identifiers to define a function prototype?

11. Generate two strings with each one being of 5 characters in length that honour the following regular expression: [_A-Za-z][0-9]+[_A-Za-z]*[0-9]

12. What would the following statements evaluate to?

```
std::cout << (12.0 + - 1 / 4 / (1 / 2) * 3/2);
std::cout << (10.0 + - (1/4) / 1 / 2 * 3.0/2);
std::cout << (10.0 + - (1/4) / (1 / (2 / 3.0)/2));
```

13. Write C++ statements to accomplish the following:
    - Declare variables m, x, b of type integer (one statement for each), and initialize them to values 3, 4, and 5, respectively.
    - Print to the console “The output of mx+b is:” followed by the value that correctly corresponds to the printed statement.

14. Write a complete C++ program that computes mx+b as stated in question 13.

15. Assume the following equation: ax^3 + bx^2 + 3. Which of the following statements are correct, if any, for the following statements that describe the equation.
    - `std::cout << ax^3 + bx^2 + 3;`
    - `std::cout << a*xxx + b*xx + 3;`
    - `std::cout << a*x*x*x + b*x*x + 3;`
    - `std::cout << a(*x*x*x) + b(*x*x) + 3;`
    - `std::cout << x*(x*a*x) + b*(x*x) + 3;`

16. Write a C++ program that computes and prints to the console the diameter, circumference, and area of a circle. Define a variable for radius of type float and initialize it to a value of 5.3.

17. Write a C++ program that prints out the following pattern to the console with one statement per row.

```
○ + ○ + ○ + ○ + 
+ ○ + ○ + ○ + ○ 
○ + ○ + ○ + ○ + 
+ ○ + ○ + ○ + ○ 
○ + ○ + ○ + ○ + 
+ ○ + ○ + ○ + ○ 
○ + ○ + ○ + ○ + 
```

18. For the pattern shown in question 17, write a C++ program that prints out the pattern using the least number of statements.

19. Suppose we wish to compute y(x) = m*x + b where m, x, and b are of type double, and y is also a double. The function y only accepts one parameter x. Write the C++ function declaration for implementing this function.

20. For the same function y(x) = m ∗ x + b, write its function definition. Assume the values of m and b are 2.34, and 532.2, respectively.

21. Write the C++ function declaration and definition for y(x) = m ∗ x + b, but this time m, x, and b are arguments to the function y.

22. In your code, replace the two lines starting with `std::cout` with the following nine lines:

```
std::cout << "O Elberth ";
std::cout << "Gilthoniel,";
std::cout << std::endl;
std::cout << "o menel palandiriel,";
std::cout << std::endl;
std::cout << "le nallon si di'nguruthos!";
std::cout << std::endl;
std::cout << "A trio nin, Fanuilos!";
std::cout << std::endl;
```

23. From question 22, what is the purpose of the space after “Elberth”?

24. From question 22, what does the console print when `std::cout << std::endl;` is executed?

25. Write a C++ program the arithmetic average of the following numbers: 2, 35, 320, 1, 5, 32, 9.

26. Write a C++ program to compute the arithmetic average of the following numbers: 2, 35, 320, 1, 5, 32.00, 9. Is there a difference in the average from question 25? Please explain your answer.