CSCE 4650/5650 ASSIGNMENT #1 SOLUTION

Fill in the Blank.

1. Name: _____

2. I have satisfied the prerequisite of CSCE 3600 Principles of Systems Programming, or equivalent, with a grade of C or better.

   Signature: _____

True or False.

For each of the problems below, indicate whether it is true or false. Justify your answer in either case.

3. A regular expression to define all even binary numbers is $(0|1)^*0$.

   True. (0|1)*0 defines all strings of 0's and 1's which end in a 0, including
   0 itself. This is exactly the set of all even binary numbers.

4. The context-free grammar below produces two different parse trees for the string `id+id*id`.

   $S \rightarrow S + S \mid S * S \mid (S) \mid \text{id}$

   True. id + id * id has two distinct leftmost derivations, S=>S+S=>id+S=>id+S*S
   =>id+id*S=>id+id*id and S=>S*S=>S+S*S=>id+S*S=>id+id*S=>id+id*id, each of which
   has its own distinct parse tree.

5. When a program is executed by a computer, that program is represented in ASCII.

   False. The program executed by a computer is a machine language program represented
   in binary.

6. All high-level programming languages (e.g., C, C++, Java, etc.) are the same with respect to their computing power (i.e., there is not something that can be programmed in one but not the other).

   True. All algorithms are characterized by recursion, iteration, and conditional
   evaluation. All high-level languages are able to express these in programs.