1. (2 pts) What is the name of the person that history designates as the first programmer?

**Augusta Ada King, also known as Ada Lovelace**

2. (2 pts) What language introduced arrays and parameterized loops but did not have recursion?

**Fortran**

3. (2 pts) Name the first programming language that had built-in garbage collection.

**Lisp**

4. (2 pts) Name the historically first, and most important, notational system for specifying the syntax of programming languages in the form of a context-free grammar. What programming language was used to describe grammars?

**BNF, Algol 58**

5. What language was C originally written in?

**B/Algol 60**

6. Explain Smalltalk’s importance in the history of programming languages?

**SmallTalk is an object oriented language that influenced many of the later languages including objective-c, java and python.**

7. What is the purpose of EBNF in contrast to BNF?

**Most programming language standards use some variant of EBNF to define the grammar of the language. Because of this there can be no disagreement on what the syntax of the language is, and it makes it much easier to make compilers**

8. Define the term LL(1).

**Left to right, performing Leftmost derivation of the sentence. LL(1) is a parser**

9. Who invented C? Unix?

**Dennis Ritchie (C) and Ken Thompson (Unix)**

10. Top-Down parsers are also called

a) LR1    
b) LL1

11. Bottom-Up Parsers are also called

a) LR1    
b) LL1
For each number associate a letter where:

a) Lexemes and Tokens  
b) Source Code  
c) annotated syntax tree  
d) Parse Tree  
e) Machine Code  
f) Target Code  
g) Program Code for an abstract machine (machine independent)  
h) Arranged Sequence of Statements in order to speed up program execution

1) _B__  2) ___A__  3) __D___  4) ___C__  5) ___H__  6) __G___  7) __F__,  8) ___E__