

Name: _____ Section (circle one): 02 (9:55) 03 (10:45)

This quiz, is due at the beginning of the second day of class. Please either print it and complete it by hand, or complete it electronically and then print it. A lot of this reading material should be familiar; some of Elaine Rich's notation may be different than you have seen before; you need to understand and use her notation. This quiz is mostly about definitions and notation. **Please print 2-sided.**

Chapter 2.

1. We consistently use the symbol Σ to denote the _____ from which we compose strings.

According to the textbook's definition, can Σ ever be infinite?

According to the textbook's definition, can a string have infinite length?

Σ^* is the _____ of all strings whose symbols come from Σ .

2. Let Σ be $\{a, b, c\}$, and let $s \in \Sigma^*$ be $abc bcc$. What is the value of each of the following expressions?

$|s|$

sa

s^0

s^2

s^R

$\#_b(s)$

How many different proper prefixes does s have?

How many different proper substrings does s have?

3. A (formal) *language* is a _____ of strings over an _____.

4. Are \emptyset and $\{\epsilon\}$ the same language? Explain briefly.

5. If the ordering of the symbols in $\{a, b, c\}$ is the order given here, arrange the following strings into lexicographic order, according to the textbook's definition: b ba abc cac ϵ ab

6. If $L_1 = \{a, ba\}$ and $L_2 = \{a, c, \epsilon\}$, how many *different* strings are in the language L_1L_2 ? _____
7. If $L = \emptyset$, what is L^* ? _____ Explain.
8. Give an example of a language L for which $L^+ \neq L^* - \{\epsilon\}$. $L =$ _____
9. Consider Exercise 2.2 On page 19. List here the letters (a, b, c, d) of the given strings that are in L_1L_2 : _____
10. Can a language (set of strings over an alphabet) ever be uncountably infinite?
11. What are the possibilities for the cardinality of the set of all languages over a given alphabet ?
Answer: _____ and _____
12. What is the relationship between $\{0\}^*\{1\}^*$ and $\{01\}^*$? (circle one)
= \subset \supset none of these

Good problems to think about, but not to turn in (not yet anyway, some may be assigned later):

Exercises 2.3, 2.5a, 2.7abde, 2.8