

Automata and Formal Languages Comprehensive Exam Solutions

Fall 2007

Problem 1 (18 points)

- (a) See Section 4.3.2 of HMU (pages 151–152 of the 2nd edition).
- (b) See Section 7.4.4 of HMU (pages 299–301 of the 2nd edition).

Problem 2 (12 points)

Classify each of the following languages as being in one of the following classes of languages: *empty*, *finite*, *regular*, *context-free*, *recursive*, *recursively enumerable*, *all languages*.

- (a) Recursive.
- (b) Recursive.
- (c) Recursive.
- (d) Recursive.

Problem 3 (12 points)

- (a) Not RE.
- (b) Not RE.
- (c) RE but not recursive.
- (d) Not RE.

Problem 4 (18 points)

See the Web solution to Exercise 10.4.1(c) of HMU.