

Homework 1

CSE 215: Foundations of Computer Science

State University of New York at Stony Brook

Instructor: Prof. Pramod Ganapathi

Total points = 135. Total questions = 7. Total pages = 2.

Questions are from our course textbook, **Brief Edition**.

Write answers neatly on plain sheets of paper, scan to PDF using a good scan app, rename the file with your student ID, and upload a single scanned PDF on Brightspace.

Problem 1. [65 points]

Truth tables (includes logical equivalence).

- (a) [5 points] Exercise Set 2.1. Problems 13, 17
- (b) [10 points] Exercise Set 2.1. Problems 22, 24
- (c) [5 points] Exercise Set 2.1. Problems 42, 43
- (d) [10 points] Exercise Set 2.1. Problems 46(b, c)
- (e) [10 points] Exercise Set 2.2. Problems 6, 8, 13(a, b)
- (f) [10 points] Exercise Set 2.2. Problems 10, 11
- (g) [10 points] Exercise Set 2.2. Problems 30, 31
- (h) [5 points] Exercise Set 2.2. Problems 25, 27

Problem 2. [15 points]

Negations.

- (a) [5 points] Exercise Set 2.1. Problems 26, 28, 29, 30, 31
- (b) [5 points] Exercise Set 2.1. Problems 33, 35, 37, 39
- (c) [5 points] Exercise Set 2.2. Problem 20 (all subquestions)

Problem 3. [10 points]

Conditional statements. Exercise Set 2.2

- (a) [5 points] Problems 33, 35, 38, 39
- (b) [5 points] Problems 41, 43, 45, 46 (all subquestions)

Problem 4. [10 points]

Exercise Set 2.3, Problem 11

Problem 5. [15 points]

Exercise Set 2.3, Problem 38 (b,c)

Problem 6. [15 points]

Exercise Set 2.3, Problem 44

Problem 7. [5 points]

For the circuit corresponding to the following Boolean expression, there is an equivalent circuit with at most two logic gates. Find such a circuit.

$$(\sim P \wedge \sim Q) \vee (\sim P \wedge Q) \vee (P \wedge \sim Q)$$