University of California, San Diego
Department of Computer Science and Engineering
**Course:** CSE 105 – Theory of Computability

**Instructor:** Adriana Palacio
2004 Summer Session I
July 19, 2004

# Problem Set 2

This problem set is not to be handed in, and it will not be graded. But you are **strongly** encouraged to solve the problems and write down the solutions. Reading the problems and mentally solving them is not enough to prepare for Test 2; writing the solutions is an important part of the assignment. As specified on the course webpage, the grades you will receive on the exams will be based both on the correctess of your solution and on clarity of presentation. **The staff will be more strict about this then when grading Test 1. Please show your solutions to a staff member during office hours to get feedback on the quality of your write-up.**

Problems 1-10 pertain to the material covered during the third week of class (July 13 - July 16). Problems 11-16 were added on July 18, 2004. These problems also pertain to the material covered during the third week of class. Solutions for these additional problems will not be provided before Test 2. The remaining problems pertain to the material covered during the fourth week (July 19 - July 23).

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**1.** Exercise 2.1

**2.** Exercise 2.3 a, b, ... , m.

**3.** Exercise 2.4 b, f.

**4.** Exercise 2.6 b, c.

**5.** Exercise 2.8

**6.** Problem 2.25

**7.** Prove that the class of context-free languages is closed under the concatenation operation.

**8.** Problem 2.16

**9.** Problem 2.18 a, c.

**10.** Problem 2.26

**11.** Exercise 2.2 a, b.

**12.** Exercise 2.4 d, e, g.

**13.** Exercise 2.6 a.

**14.** Problem 2.15

**15.** Problem 2.17 b.

**16.** Exercise 3.5

**17.** Exercise 3.7

**18.** Problem 3.14 a, b, c, d, e.

**19.** Problem 3.15 a, b, c, d.

**20.** Exercise 4.1

**21.** Exercise 4.2

**22.** Exercise 4.4

**23.** Exercise 4.5

**24.** Problem 4.10

**25.** Problem 5.2 (You will be able to do this after the lecture on July 22.)