HELSINKI UNIVERSITY OF TECHNOLOGY — **Exercise 5**
Networking Laboratory — 8.3.2004
S-38.215 Special Course in Networking Technology, Spring 2004 — Aalto

1. (Lawler, Exercise 4.1) Consider a simple random walk ($p = 1/2$) with absorbing boundaries on $\{0, 1, 2, \ldots, 10\}$. Suppose the following payoff function is given

$$[0, 2, 4, 3, 10, 0, 6, 4, 3, 3, 0].$$

   Find the optimal stopping rule and give the expected payoff starting at each site.

2. (Lawler, Exercise 4.2) The following game is played: you roll two dice. If you roll a 7, the game is over and you win nothing. Otherwise, you may stop and receive an amount equal to the sum of the two dice. If you continue, you roll again. The game ends whenever you roll a 7 or whenever you say stop. If you say stop before rolling a 7, you receive an amount equal to the sum of the two dice on the last roll. What is your expected winnings: (a) if you always stop after the first roll; (b) if you play to optimize your expected winnings?

3. (Lawler, Exercise 4.4) Consider Exercise 2. Do the problem again assuming:

   (a) a cost function of $g = [2, 2, 2, 2, 1, 1, 1, 1, 1, 1, 1]$;

   (b) a discount factor $\alpha = 0.8$;

   (c) both.