

## Computer Structure - Spring 2008

### Assignment No. 4

**Firm Deadline: 24.6.08 – 10 AM before the beginning of the lecture**

1. Answer Question 5.4 from the lecture notes.
2. Answer Question 5.6 from the lecture notes.
- 3.

**Question:** Design a bi-directional cyclic shifter. Such a shifter is like a cyclic left shifter but has an additional input  $\ell \in \{0, 1\}$  that indicates the direction of the required shift. Hint: Consider reducing a cyclic right shift to a cyclic left shifter. To simplify the reduction you may assume that  $n = 2^k - 1$  (hint: use one's complement negation). Suggest a simple reduction in case  $n = 2^k$  (hint: avoid explicit subtraction!).