Homework 7 covers materials in sections 7-1 through 7-10 and sections 8-1 through 8-9 of textbook. You need NOT turn in the homework. However, you are strongly advised to do it. Short solutions will be posted on the course website shortly. We encourage you to work collaboratively with your classmates to the degree that it facilitates your learning. The material covered by this homework applies to the Final Exam on May 17.

Problems with a * have a solution available at the Prentice Hall Companion Website (http://www.prenhall.com/mano).

1. *(Register transfer) Problem 7.1 in text.
2. (Register transfer) Problem 7.2 in text.
3. (Register transfer) A register R is to support the transfers shown in the following table. Design a cell of the register a) using a D flip-flop, b) using a J-K flip-flop.

<table>
<thead>
<tr>
<th>S1</th>
<th>S0</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>R ← R</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>R ← R ⊕ S</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>R ← ¬R</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>R ← R v S</td>
</tr>
</tbody>
</table>

4. *(Register transfer) Problem 7.6 in text.
5. (Register transfer) Problem 7.7 in text.
6. (Micro-operations) Problem 7.10 in text.
7. *(Micro-operations) Problem 7.11 in text.
8. *(Bus Transfer) Problem 7.14 in text.
9. (Bus Transfer) Problem 7.15 in text.
10. (Memory Transfer) Problem 7.17 in text.
11. (Datapath) Problem 7-18 in text.
12. *(Datapath) Problem 7-19 in text.
13. *(ALU) Problem 7-22 in text.
15. *(Barrel shifter) Problem 7-26 in text.
16. (Control word) Problem 7-27 in text.
17. *(Control word) Problem 7-28 in text.
18. *(ASM) Problem 8-1 in text.
19. (ASM) Problem 8-3 in text.
20. (ASM) Problem 8-4 in text.
21. *(ASM) Problem 8-5 in text.
22. *(ASM) Problem 8-9 in text.
23.  (ASM) Problem 8-10 in text.
24.  (Multiplier) Problem 8-13 in text.
25.  (Multiplier) Problem 8-14 in text.
26. *(Control) Problem 8-17 in text.
27.  (Verilog) Problem 8-23 in text (write code only).
28.  (Single Cycle computer) Problem 8-31 in text.
29. *(Single Cycle computer) Problem 8-32 in text.
30.  (Single Cycle computer) Problem 8-34 in text.
31.  (Single Cycle computer) Problem 8-36 in text.