King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering
Department of Computer Engineering

COE 202 – Fundamentals of Computer Engineering (T061)

Homework # 04 (*due date & time: Monday 27/11/2006 during class period*)

***** Show all your work. No credit will be given if work is not shown! *****

Problem # 1 (20 points): The following truth table is for a circuit that accepts two 2-bit unsigned numbers *A* (A_1A_0) and *B* (B_1B_0). The circuit has one output, *X*, that is equal to 1 when $(A - B) \geq 0$. **Use a 4×16 decoder and external gate(s) to implement the circuit.**

A_1	A_0	B_1	B_0	X
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Problem # 2 (20 points): Repeat problem # 1 but **use a 4×16 inverted-output decoder and external gate(s)**.

Problem # 3 (20 points): Repeat problem # 1 but **use a 16×1 MUX and external gate(s)**.

Problem # 4 (20 points): Repeat problem # 1 but **use an 8×1 MUX and external gate(s). Connect A_1, A_0, and B_1 to S_2, S_1, and S_0, respectively**.

Problem # 5 (20 points): Repeat problem # 1 but **use an 8×1 MUX and external gate(s). Connect A_0, B_1, and B_0 to S_2, S_1, and S_0, respectively**.