NDU
Computer Organization & assembly language
CSC 222 Midterm exam.
Duration 1 hour 30 minutes.

Name:_____

1. Perform the subtraction of the following ***SIGNED*** numbers using the complement method: Show your work. (5 pts each)
   a. 10010 – 10 (Binary)

   b. 18AF – 2BBB (Hexadecimal)

   c. 76543 – 7777 (octal)

2. Perform the following conversions: Show all the steps (5 pts each)

Decimal	Binary	Hexadecimal	Octal
		AB.CD	
			47.25

3. What is the capacity of each of the following memories; what is the number of the input/output data lines, and the number of the address lines? (2.5 pts each)
   a. 256Kx128

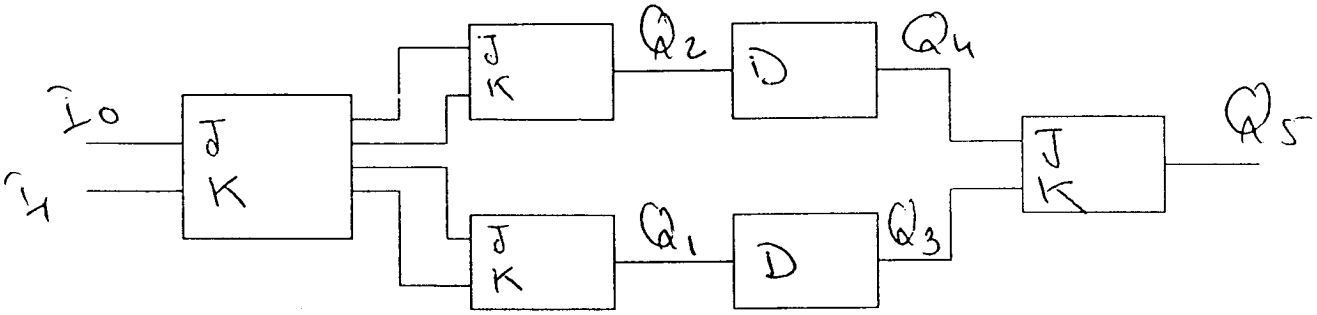
   b. 1024Mx256

4. Let F(A,B,C,D) = $\sum$(0,1,3,5,6,7,9,10,11,12,13,15).
   a. Draw the karnaugh map. (5 pts)
   b. Derive the simplified equation. (5 pts)
   c. Draw the logic circuit using NAND gates. (5 pts)
   d. Draw the same circuit using one 8x1 MUX. (5 pts)

5. Simplify the following expression using Boolean algebra:
F = xy'z + x'yz' + x'y' + xz' + z'y'. (7.5 pts)

6. Get the complement of the following expression (F'):
F = xy'z + x'yz' + x'y' + xz' + z'y'. (7.5 pts)

7. For the following circuits, what will be the output of Q5 for each input of I0 & I1? (15 pts)



I0	I1	Q5
0	0	
0	0	
0	1	
1	1	
1	1	
0	0	
1	1	
0	1	
1	0	
1	0	