- Homework is due at the beginning of class
- Start early and get help if you need it
- Show all work neatly and clearly; redraw and/or rewrite problem if needed as work turned in should stand alone
- Identify your answers (with units) using a box or circle
- Staple multiple pages together

1. Convert the following decimal numbers to their binary equivalent.

   (a) $(111)_{10}$

   (b) $(232)_{10}$

2. Consider the table that counts up corresponding values of 4-bit binary numbers, octal numbers, decimal numbers and hexadecimal numbers.

   (a) What are the octal, hexadecimal and binary equivalents of $(11)_{10}$?

   (b) What are the octal, decimal and hexadecimal equivalents of $(0100)_2$?

3. Consider the Boolean expression $Y = \bar{A}\bar{C} + \bar{B}C + AC$ where Y is the output and the three inputs are A, B, C.

   (a) Use inverters and two-input AND and OR logic gates to construct the logic circuit that realizes the Boolean expression.

   (b) Write the truth table that results from the Boolean expression.

4. Consider the truth table given below for a two-bit adder with two inputs A, B and two outputs C, S.

A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

   (a) Find logical expressions for outputs C and S in the form of a sum-of-products (SOP), and

   (b) use inverters and two-input AND and OR logic gates to construct logic circuits that realize C and S.

5. Write a Boolean, sum-of-products (SOP) expression for the output Y in terms of inputs A, B, C, D for the following truth table.

A	B	C	D	Y
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

6. Using the logic circuit shown below, find the Boolean expression for the output Y in terms of the four inputs A, B, C, D.