Discrete Math HW #6

Chapter 16

Exercises pp. 595-596 #13, 15, 18, 21, 22, 58   (3 pts. each)

Complete the questions below

(4 pts. each)

Consider the check digit schemes we studied: car rental numbers, ISBN 10, ISBN 13, UPC, bank routing numbers, credit card numbers.

1. Which of the schemes above will not catch all single-digit errors? Give an example of a single-digit error that is not caught.

2. Which of the schemes above will not catch all transposition errors? Give an example of a transposition error that is not caught.

3. A company uses the check-digit scheme

$$2a_1 + 4a_2 + 6a_3 + 8a_4 \equiv a_5 \ (\mathrm{mod} \ 12).$$

Notice that the coefficients are not relatively prime to the modulus. Find all possible digits that could fit in the blanks below.

   a. _1530   b. 8_336