AP Computer Science
Litvin Ch 4 - Algorithm Worksheet

Name _____
Date _____ Period _____

1) Draw a flowchart for the following problem. A student wants an A (90-100%) for the semester in her CS class. Tests are worth 80% of her grade and the final exam is worth 20%. She has a file that contains all of her test scores (but not the final) as integers from 0 to 100. Draw a flowchart that calculates the lowest grade she needs on the final to get an A for the semester. If the score she needs is over 100%, then print “Impossible”.

2) A man must get a fox, a chicken, and a sack of corn safely across a river in a rowboat. He can only take one at a time. Unfortunately, if he leaves the fox alone with the chicken, the fox will eat the chicken. If he leaves the chicken alone with the corn, the chicken will eat the corn. How does the man get all three safely across? Find a solution and write a flowchart that describes how it is done.

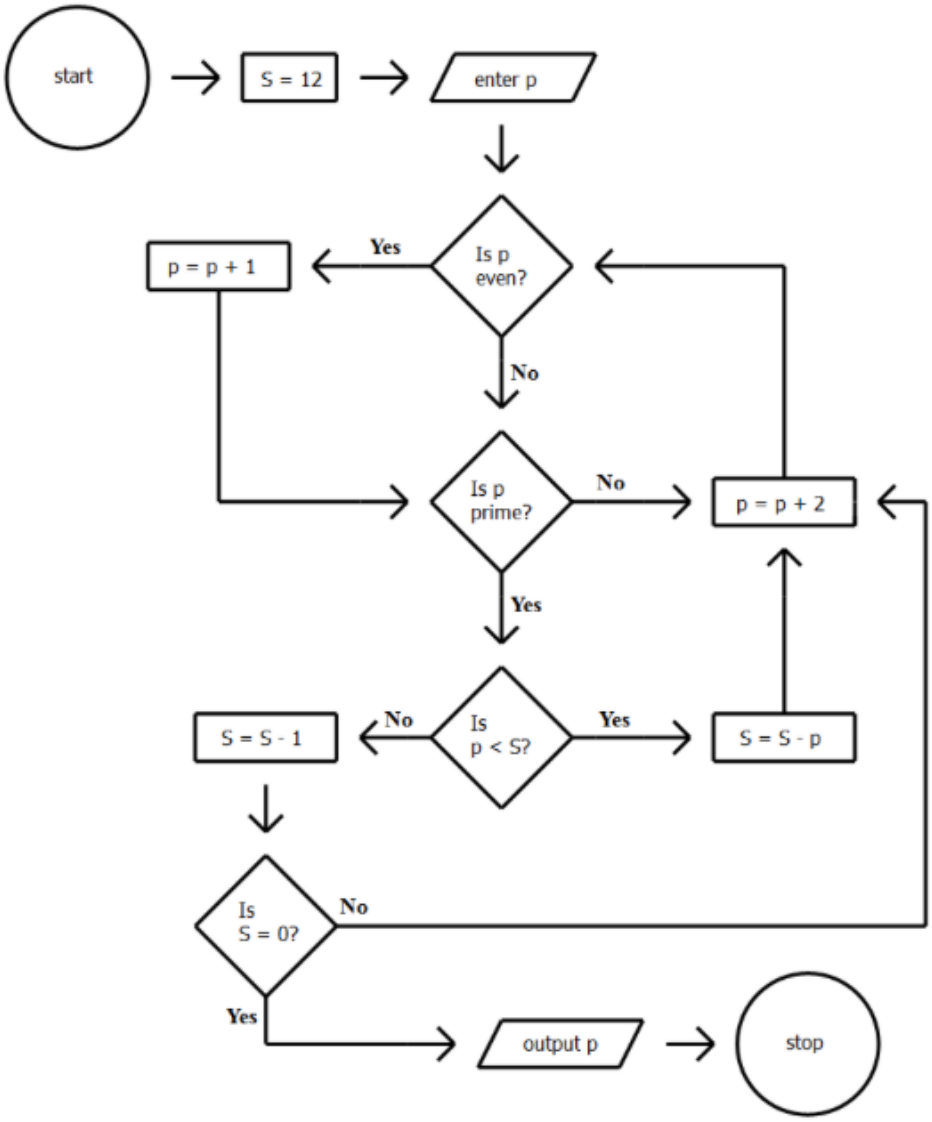
3) Write pseudocode for Euclid's GCD algorithm. Refer to the flowchart in Litvin p. 86.

4) Write a flowchart for the following Bubble Sort algorithm.

1. Shuffle a pack of cards.
2. Place each card face down on the table in a row.
3. Starting with the card furthest to the left, do the following.
    a. Look at the current card and the next card.
    b. If the current card is greater than the next card, then swap them.
    c. Make the next card the current card.
    d. Continue through the row repeating a-c until you reach the end of the row.
4. Go back and repeat step 3 until there are no more swaps.

5) Study the following flowchart.

a) Fill in the table tracing variables S and p where p = 15 for “enter p”.



S	p

b) Write Java code for this flowchart. Assume you have a method `isPrime(int n)` already defined that returns true or false.

6) Research on the Internet the “Friendship Algorithm” from “The Big Bang Theory” and write the flowchart.