Software Engineering - First Exam Spring 2013

Answer 3 of the following 5 questions for 10 points each.

Q1 Describe 5 of the advantages of iterative vs. waterfall software development methods.

Q2 A team of 4 programmers have decided to use extreme programming for developing a Scala application using Eclipse. Unfortunately each member of the team is located on a different continent. What would be the modifications to the development methodology that you would suggest to them? For reference, you can assume they have all read the wiki page at: http://en.wikipedia.org/wiki/Extreme_programming.

Q3 In 2025 humans finally make it to a trip around planet Mars. Unfortunately the long flight is mostly boring, and purely for entertainment purposes, a special internet service needs to be designed for them. The bandwidth at that huge distance is only about 2 kbytes / second and the time for sending information between the spaceship and Earth can be as high as 8 minutes. Provide a set of requirements for designing the client side (browser run on the spaceship) and the server side (run on Earth) that provide the best possible user experience under those constraints. Explain how each requirement contributes to your goals. Major Web sites sponsoring the trip are willing to place on their servers everything needed to match your requirements.

Q4 Briefly specify the goals and requirements and then prototype a small Scala program that, given a dictionary of valid English words, finds all the anagrams of a word entered by the user. An anagram is made by reordering all the letters in a word in one or more words.

Q5 Write a small Scala program that outputs a the list of first n twin primes (odd primes such that their difference is 2). For example, 11 and 13 are twin primes, 15 and 17 are not, 2 and 3 are not.