PHA 5127 - Homework 1

Please show all work to receive full credit.

Fall 2014

1. Table 1 shows the serum concentration profiles of a certain drug in patient X.

    a. Calculate AUC 0-t_{last} and $AUC_{0\text{-}inf}$ by trapezoidal rule.

    b. Calculate the concentration of the drug X in serum at time 5 hr.

    Table 1

Time (hr)	Conc (ng/mL)
0	20
1	16.37
1.5	14.82
2	13.41
4	8.99
6	6.02
8	4.04
10	2.71
12	1.81

2. A single dose of a drug X was administered as an IV bolus to a patient. The plasma concentration was determined 2 hrs after the drug was administered and it came out to be 16.37 mg/L. Four hours later the plasma concentration was observed to be 10.98 mg/L. Assume the drug follows first order elimination and a one compartment body model.
    a. Calculate the initial concentration.
    b. Calculate the value of the first order elimination rate constant and half-life.
    c. Calculate the Volume of distribution if the dose given is 500 mg.

3. (T/F) When whole blood is collected in a heparinized test tube and then centrifuged, the supernatant that is obtained is serum.
4. (T/F) The fraction of the drug being eliminated per hour is increasing in a first order process.
5. (T/F) The $t_{1/2}$ of a zero order process can be determined.