PHA 5127 (Fall, 2008)
Case Study #1
Questions

Q1. 800 mg of drug X was administrated to a patient through i.v. bolus. The drug plasma concentrations monitored after injection are listed in the table below.

Time (min)	Conc. (mg/l)
2	72.9
7	57.9
15	40
30	20
60	5

a) Please state whether the drug follows a zero- or a first-order elimination process.

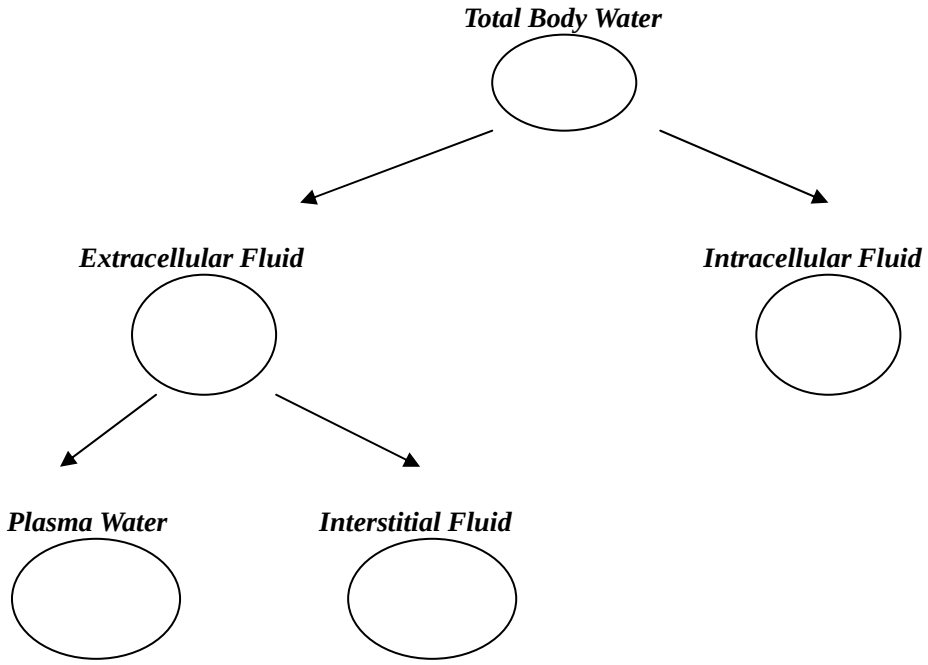
b) Estimate the elimination rate constant (ke) and half-life (T1/2).

c) Estimate the initial plasma drug concentration (C_0) and volume of distribution (Vd).

d) Estimate the initial plasma drug concentration (C_0) and $AUC_{0\text{-inf}}$.

e) Predict the drug plasma concentration 2 hrs after the injection (C_{120}).

Q2. Please fill in the missing numbers!



Q3. Mark each of the following statements True or False.

T F For a first-order elimination process, the same amount of drug is eliminated during a given time interval.

T F For a zero-order elimination process, the half-life (t1/2) depends on the drug concentration.

T F In a perfusion limited distribution, tissue membrane represents no barrier for the drug diffusion.

T F In a permeability limited distribution, blood flow is not important for rate of uptake.

T F Volume of distribution is the real tissue volume that contains the drug.

Q4. Define the term biopharmaceutics and pharmacokinetics.