

1. Cocaine is known to follow one-compartment model pharmacokinetics. After 30mg is administered as a single i.v. bolus dose, the following data were observed.

Time (h)	Conc (mg/L)
0.5	0.1213
1	0.0736
2	0.0271
3	0.0100

- Calculate its half-life and elimination rate constant.
- Calculate the initial plasma concentration C_0 .
- Calculate the volume of distribution.
- Calculate the amount of drug in the body at 4 hour.
- Calculate $AUC_{0-\infty}$ by trapezoidal rule.

Note: circle your final result for each question above.

2. Drug X is give as a single i.v. bolus and plasma concentrations are determined as follows:

time(h)	conc(mg/L)
0	50
1	42
2	34
3	26
4	18

Is this drug eliminated by a first- or zero-order process? What is the half-life? Defend your answer in two sentences or less.

- Given a lipophilic drug that can enter the tissue, state how the volume of distribution will change under the following conditions. If not mentioned, other parameters are assumed to be fixed. (Use equations as in Lesson 8 to state your answer.)
 - F_u increases
 - $F_{u,T}$ increase
 - Both F_u and $F_{u,T}$ double
 - F_u increases and $F_{u,T}$ decreases
- Given the following information about two acidic drugs, state whether their distribution is permeability limited or perfusion limited and provide brief explanation.

Drug	pKa	Partition coefficient of unionized form
X	2.5	0.1
Y	7.3	3.5