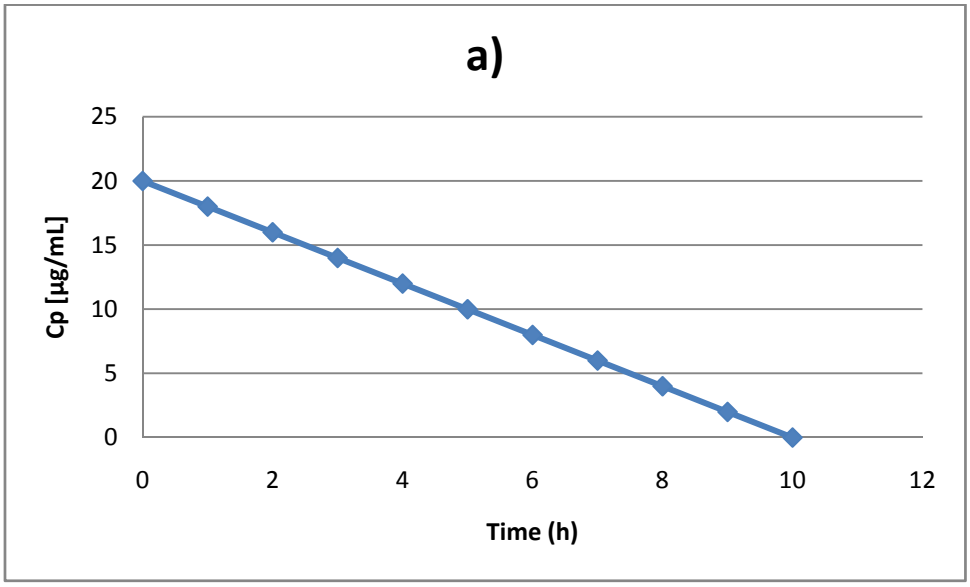
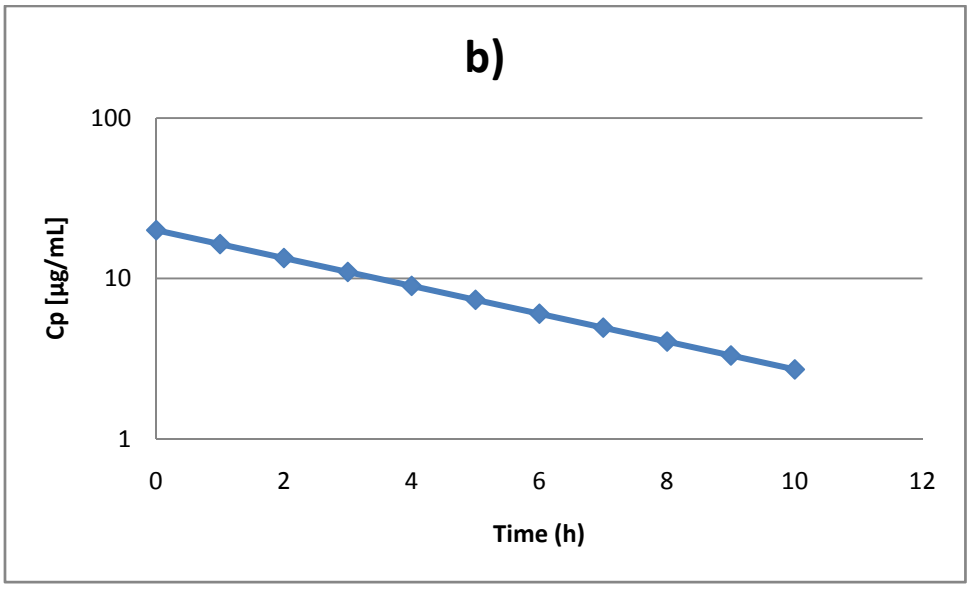
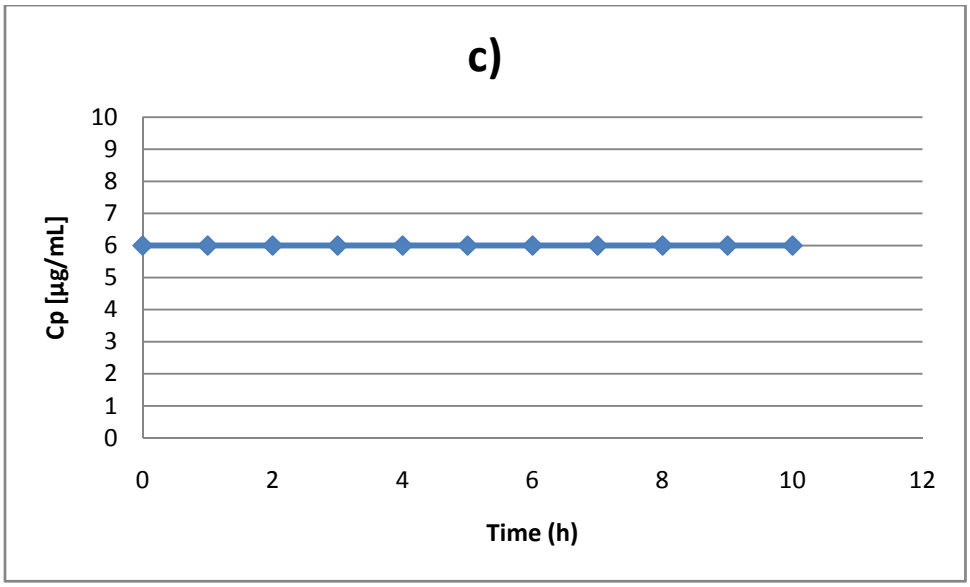
PHA 5127 Dose Optimization I

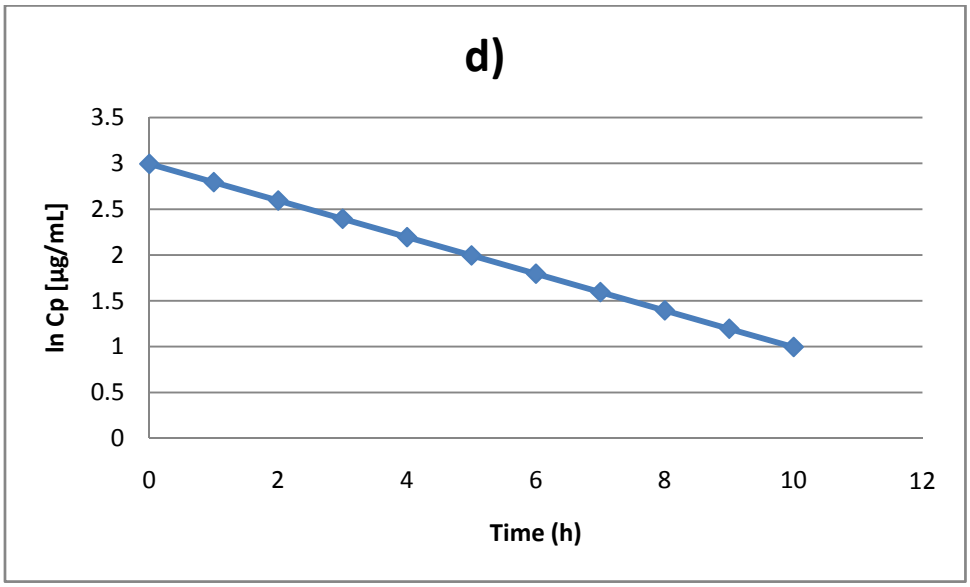
Case Study I

1. **Determine whether the elimination process in the graphs a-d is zero-order or first order. (Cp: Drug concentration in plasma)**









2. 200 mg Drug A was administered to a female patient (60 kg) through IV bolus injection. The following plasma concentrations (Cp) were observed.

time (h)	Cp (µg/mL)
1	1.260
4	0.315
8	0.050
12	0.008

a) Plot Cp vs. time and determine the order of the elimination process
b) Determine k_e and $t_{1/2}$ (half life)
c) Estimate the initial concentration C_0 and the volume of distribution (Vd)
d) Calculate $AUC_{0\text{-}t(last)}$ and $AUC_{0\text{-}\infty}$
e) Calculate $\frac{AUC_{0-t(last)}}{AUC_{0-\infty}} * 100\%$
f) Predict the plasma concentration after 6 hours

3. Define **LADME** and **pharmacokinetics**

4. TRUE (T) or FALSE (F)

The plasma concentration time profile of a certain drug is dependent on the dosage form

T F

For a zero-order elimination process the half-life is dependent on the plasma concentration at time point 0 (C_0)

T F

For a first-order elimination process the half-life is dependent on the plasma concentration at time point 0 (C_0)

T F

Drugs with a high volume of distribution (Vd) have a narrow therapeutic window

T F

In the case of perfusion limited distribution, the blood flow determines the rate of uptake

T F

In the case of permeability limited distribution, the blood flow is not important for the rate of uptake

T F