

PHAR 750 Quiz I - A

PHAR 750: Biopharmaceutics/Pharmacokinetics
October 5, 2006

Name: Key ^{Fall} 2006 Q-1A
Total 25 points

Remember units!

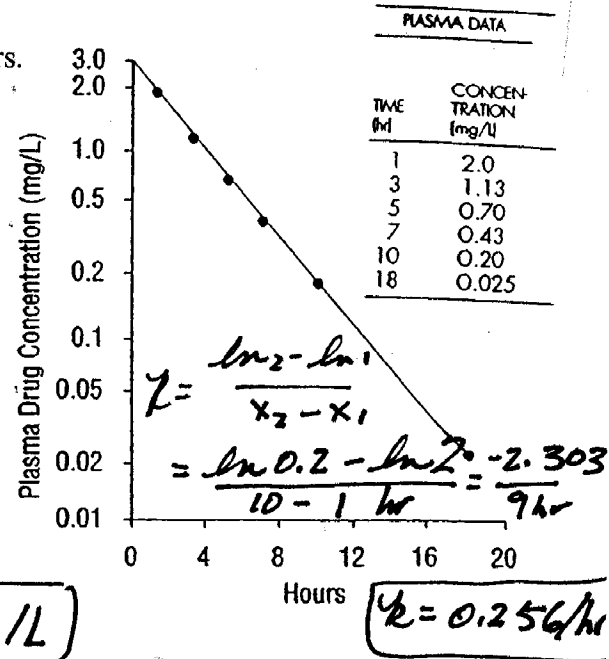
This quiz is worth 25 points. Please **CIRCLE** your final answers.

- 1 a. Is the following data zero-order or 1st order? (2 pt)
 b. What is the elimination rate constant (k)? (2 pt)
 c. What is the C_p⁰? (2 pt) 3.0 mg/L
 d. What is the equation for this data? (3 pt)
 $C_p = (3.0 \text{ mg/L}) e^{-\frac{0.256}{hr} t}$
 e. What will the C_p be after 6 hrs (3 pts)?

+5%

$$C_p = \frac{3.0 \text{ mg}}{L} e^{-\frac{0.256}{hr} 6 \text{ hr}}$$

$$C_p = \left(\frac{3.0 \text{ mg}}{L}\right) (0.215) = \boxed{0.646 \text{ mg/L}}$$



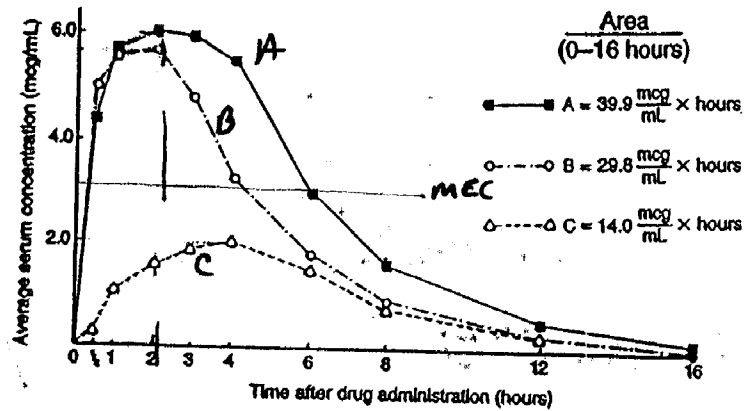
TRUE or FALSE for questions 2 - 4 below (2 points each).

- (F) 2 The half-life ($t_{1/2}$) decreases with increasing dose for drugs that display first-order pharmacokinetics.
 (T) 3 The half-life ($t_{1/2}$) increases with increasing dose for drugs that display non-linear pharmacokinetics.
 (T) 4 The half-life ($t_{1/2}$) is dependent on the amount/concentration of drug in zero-order pharmacokinetics.

SHORT ANSWERS – Answer **ONLY ONE** of the questions below (a, b, or c). Please be as thorough as possible with your answers. (3 points)

- 5a. How can one optimize drug therapy by utilizing the PK and PD of a drug?
 5b. How can the dosage form affect the bioavailability of a drug?
 5c. How can the enzymes and/or transporters affect the bioavailability of a drug?

6. Below is a graph of 3 different dosage forms (A, B, C) of the same amount of drug. Using the graph below to answer questions 6a and 6b and give YOUR BEST ESTIMATE for the following questions.



- a) If the minimum effective concentration is 3.0 mcg/mL, which dosage(s) forms (A, B, or C) will NOT be effective? Why? (2 pts)

Dosage C - because below the MEC.

- b) For Drug A above, what is the C_{\max} and T_{\max} (2 pts)?

$$C_{\max} = 6.0 \mu\text{g/mL} \text{ or } 6.0 \text{ mcg/mL}$$

$$T_{\max} = 2 \text{ hours}$$