

**PHA 5127**  
**FINAL EXAM**  
**FALL 1997**

On my honor, I have neither given nor received unauthorized aid in doing this assignment.

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Name \_\_\_\_\_

Question	Points
1.	_____/14 pts
2.	_____/10 pts
3.	_____/8 pts
4.	_____/8 pts
5.	_____/12 pts
6.	_____/8 pts
7.	_____/20 pts
8.	_____/20 pts
9.	_____/20 pts
10.	_____/20 pts
TOTAL	_____/140

Name \_\_\_\_\_

SS#: \_\_\_\_\_

1. What parameters are used to test for bioequivalence? Explain why? (14 Points)

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2.) Explain the difference between absolute and relative bioavailability? (10 points)

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3.) The area under the plasma concentration time profile is an indicator of (8 points):

- Rate of absorption
- Extent of absorption
- Peak plasma concentration
- Time of peak plasma concentration.

4) Due to the nature of biological membranes, drugs with the following properties are more likely to cross most membrane barriers? (8 points)

- ionized and lipophilic
- ionized and hydrophilic
- Non-ionized and lipophilic
- Non-ionized and hydrophilic

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5.) (12 points)

T F The liver receives the blood supply from the GI tract via the portal vein prior to entrance of the blood into the general circulation.

T F For drugs with high extraction, clearance is affected mainly by the liver blood flow.

T F For drugs with high extraction, oral bioavailability depends on plasma protein binding.

T F A drug's elimination half-life (as reflected by the terminal slope of the concentration time profile) is always the same, regardless of its formulation characteristics.

T F For rapidly absorbed as well as sustained-released products of the same drug, the drug dose is directly related to AUC.

T F Muscle tissue often represents the peripheral compartment for two-compartment model drugs.

6.) For a drug that is eliminated by both metabolism (low extraction) and glomerular filtration, a decrease in plasma protein binding will (8 points):

- generate an increase in both  $V_d$  and  $CL_{Hep}$
- significantly affect the oral bioavailability
- decrease renal clearance
- not affect renal clearance if there is "complete" reabsorption (i.e. the maximum tubular reabsorption which occurs when the free drug levels are equal in plasma and urine)

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7.) A patient is to receive tobramycin 120 mg intravenously every 8 hours (given over 60 min). The patient is assumed to have an average  $K$  of  $0.25 \text{ hr}^{-1}$  and a  $V_d$  of 15 L. (20 points)

a) How many doses must be administered before steady state is reached? Give calculations

- One dose
- Two doses
- Three doses
- Four doses.

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- b) Calculate the actual peak plasma concentration in the above patient after 100 doses have been administered.

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8.) (20 points)

a) Discuss why pharmacokinetics are often assessed by non-compartmental approaches.

b) What pharmacokinetic parameters can be determined with this approach?

Name \_\_\_\_\_

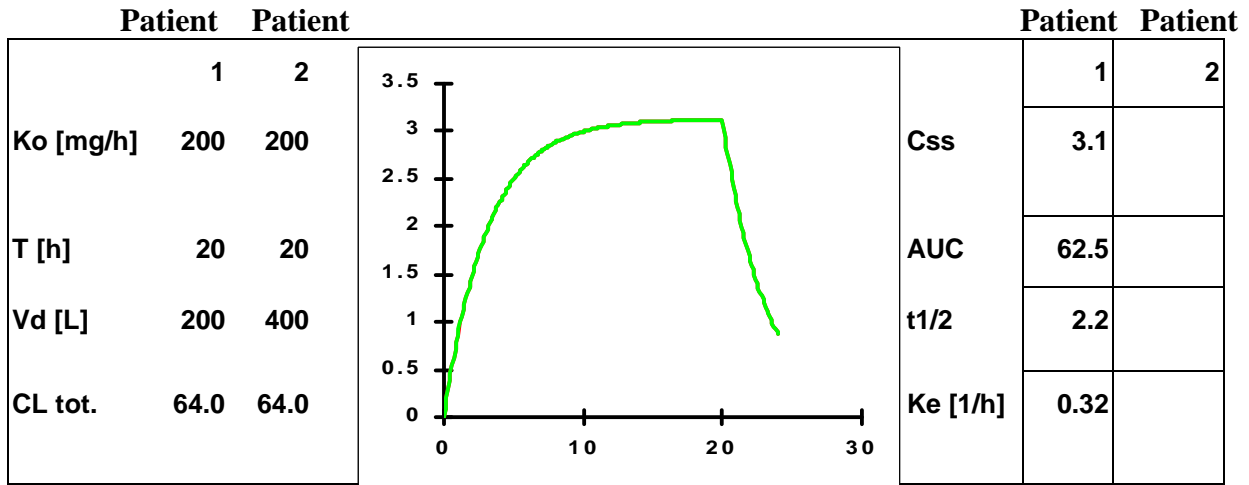
SS#: \_\_\_\_\_

- 9.) An patient had been taking 400 mg of phenytoin per day for 1 month and had a plasma concentration of 6.0 mg/L when sampled 6 hr after the dose. Because of continued seizures, the patient was seen in a clinic, and the dose was increased to 500 mg/day. Four weeks later the patient was seen in a clinic, and the plasma concentration 6 hours after the dose was 9.0 mg/L (assume steady state). The physician asked the dose be increased to provide a plasma concentration of 12 mg/L 6 hours after the dose. What dose would you recommend? (20 points)

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10) (30 Points)



Enter Data in Above Boxes

Two patients differ in their volume of distribution as indicated in above scheme. Complete the graph for patient 2. In addition give the estimates for  $C_{ss}$ , AUC,  $t_{1/2}$  and  $k_e$  for patient 2.