Name: _____

OR

UFID #: _____

PHA 5127

First Exam

Fall 2004

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

Name

Put all answers on the bubble sheet. **If you need to comment or question a problem please note this on the front page.**

TOTAL _____/160 pts

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Question Set I (True or False)
(25 points)

True (A) or False (B). On the bubble sheet mark *A for true* or *B for false*

For a high extraction drug

1: **T** F Hepatic clearance will be larger than that of a low extraction drug

2: **T** F Hepatic clearance will depend on liver blood flow

3: T **F** Hepatic clearance will depend on plasma protein binding

4: **T** F Oral bioavailability will be low

5: T **F** Hepatic clearance will be determined by the GFR

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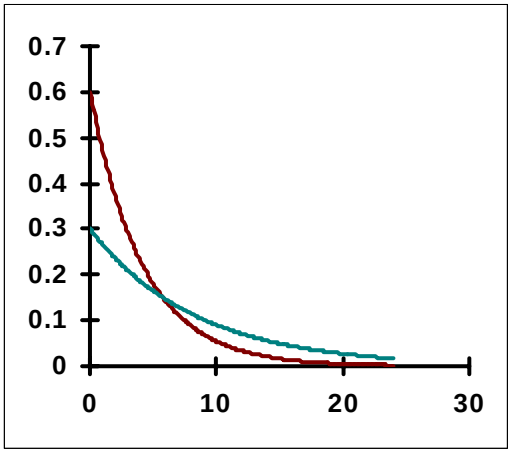
Question Set II
(15 points)

Compare the following two concentration time profiles after a single bolus injection. The two lines differ in only one of the subsequent parameters. Please identify which parameter is different.



6: The 2 lines differ in:

	Parameter
A.	Dose
B.	**Vd**
C.	Clearance

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Question Set III (Matching)
(20 points)

For the physiological changes listed below, select the induced changes on the pharmacokinetic parameters for a lipophilic, unionizable (no acid or basic group in the molecule), protein bound **high extraction** drug that is also eliminated by renal elimination (only filtration, no reabsorption).

Select the effect on kinetics
(A) $Cl_{REN} \downarrow$ *(B)* $Cl_{HEP} \uparrow$ *(C) oral bioavailability* $\downarrow$ *(D)* $V_D \uparrow$ E. none of the listed answers

Physiological change
7: Increase in metabolic enzymes__**C**___

8: Decrease in plasma protein binding __**C or D**__

9: Increase in liver blood flow__**B**__

10: Decrease in creatinine clearance__**A**___

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Question Set IV (Matching)
(20 points)

(Assume GFR is 130 mL min^{-1}, urine flow is 1.5 ml min^{-1}) For the following situations, indicate whether the drug is:

Select from the following choices:
(A) only filtered *(B) filtered and reabsorbed through passive diffusion*
(C) filtered and actively secreted *(D) filtered and reabsorbed through transporters*

11: A drug with f_u = 0.04and a Cl_{REN} = 40 mL min^{-1} is **_C__**

12: A drug with f_u = 0.20 and a Cl_{REN} = 26 mL min^{-1} is **_A__**

13: A drug with f_u = 0.30 and a Cl_{REN} = 0.45 mL min^{-1} is _B__

14: A drug with f_u = 1.0 and a Cl_{REN} = 0.15 mL min^{-1} is **_D__**

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Question Set V

(20 points)

A drug is eliminated through glomerular filtration (no other clearance mechanisms is observed). **It does not bind to plasma proteins**. Glomerular filtration rate is normal (**130 ml/min**). No active renal secretion and passive or active reabsorption after renal filtration is observed. The volume of distribution is **50 L.**

15: What is the clearance? (10 points)

A: 1.3 L/h
B: 2.2 L/h
C: 7.8 L/h
D: 80 L/h

16: What is the k_e of the drug? (10 points)

A: 0.044 h^{-1}

B: 0.0260 h^{-1}

C: 0.1560 h^{-1}

D: 1.600 h^{-1}

E: 0.390 h^{-1}

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Question Set VI
(10 points)

17: The nurses gave an iv bolus injection of an unknown drug at 7 a.m. They also did not record the dose. One hour after injection (8 a.m.) the concentration was found to be 6mg/L of plasma. Assume a k_e of 0.150 h^{-1}.

What would be the concentration at 8 pm?

A 1.15 mg/L

B 0.8 mg/L

C 1.0 mg/L

D 0.1 mg/L

E 0.2 mg/L

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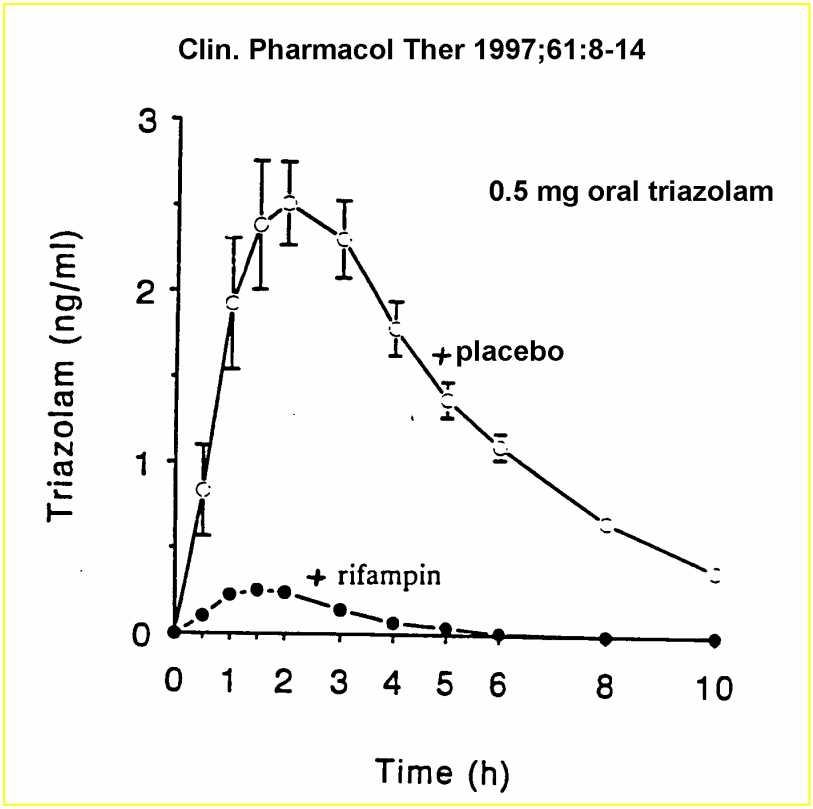
Question Set VII

The same dose of triazolam was given either alone or with rifampin. Explain what is going on. (5 points)



Please choose the correct answers.

1: The clearance of triazolam is decreased in the presence of rifampin.
2: Triazolam is likely to be a high extraction drug.
3: Rifampin is an enzyme inducer.
4: Rifampin increases the volume of distribution of Triazolam.

18. Select the correct answer

A: 1
B: 1, 2
C: 3
D: 2, 3
E: 4

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Question Set VIII (True or False)
(25 points)

True (A) or False (B). On the bubble sheet mark *A for true* or *B for false*

For a lipophilic unionized drug (no acid, or base)

19:	T	**F**	The renal clearance will depend on the tissue binding of the drug.
21:	**T**	F	The renal clearance will depend on plasma protein binding.
22:	**T**	F	Drinking a lot of water will increase the renal clearance.
23:	T	**F**	Involvement of renal transporters in the renal elimination of the drug is likely.
24:	**T**	F	The renal clearance will be smaller than the GFR.

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Question Set IX (True or False)

(20 points)

True (A) or False (B). On the bubble sheet mark *A for true* or *B for false*

25: **T** F The tissue uptake of a lipophilic unionized drug is more likely to be perfusion controlled.

26: T **F** The degree of plasma protein binding affects the metabolic clearance of all drugs that are metabolized in the liver.

27: **T** F Increase in plasma protein binding will decrease the volume of distribution of a lipophilic drug.

28: **T** F The renal clearance of a highly ionized drug is more likely to be affected by drug/drug interactions.