

**Exam I Fall 95  
Biochemistry 410**

Name \_\_\_\_\_  
I.D. \_\_\_\_\_

4. What is the principal type of attractive force which stabilizes the  $\alpha$  - helix or the  $\beta$  - sheet structures of proteins? (5 points)

5. Examine and complete the table given below describing the purification of a protein and answer the following questions:

Purification step	Volume (ml)	Protein (mg/ml)	Activity (Eu/ml)	Eu/mg	Total activity	fold purification	% recovery
Crude extract	500	12000	50000	4.17	25000000	0.00	100.00
Ammonium sulfate ion exchange	350	2500	48000	19.20	16800000	4.61	67.20
molecular sieve	50	350	40000	114.29	2000000	5.95	8.00
Affinity column	50	15	50000	3333.33	2500000		
	5	1	38000	38000.00	190000		

a. Which individual step gave the greatest purification? (3 points)

b. Other than the preparation of the crude extract, which step gave the highest recovery? (3 points)

c. Speculate on why you get an increase in the total activity recovered when purifying your protein through the molecular sieve column? (4 points)

# Bioch 410 Exams

Exam I Fall 1995  
Biochemistry 410

Name \_\_\_\_\_  
I.D. \_\_\_\_\_

DO NOT REMOVE STAPLES

1. Define the following with respect to an enzyme-catalyzed reaction:  
(2 points each)

Zero order kinetics:

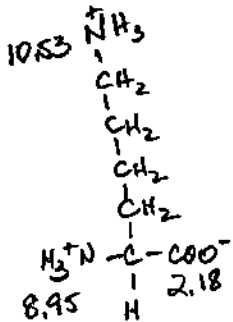
First order kinetics:

$V_{max}$

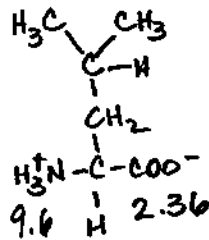
$K_m$

2. Examine the following amino acid structures and give:

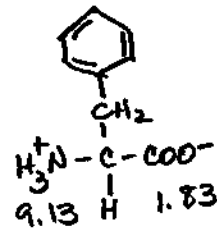
i) the single letter abbreviation for each (1 point each), and  
ii) the pI for each. (1 point each)



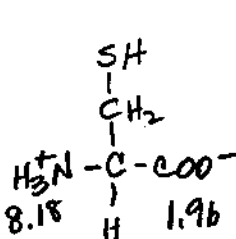
a. \_\_\_\_\_  
pI \_\_\_\_\_



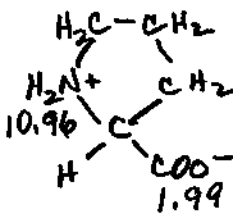
b. \_\_\_\_\_  
pI \_\_\_\_\_



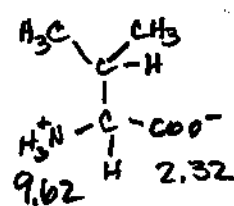
c. \_\_\_\_\_  
pI \_\_\_\_\_



d. \_\_\_\_\_  
pI \_\_\_\_\_



e. \_\_\_\_\_  
pI \_\_\_\_\_



f. \_\_\_\_\_  
pI \_\_\_\_\_

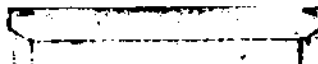
3. What is the pI of a tripeptide composed of the above residues a-c-f? (4 points)  
(Assume that the pI of the R groups does not change when the amino acid is part of a peptide.)

DO NOT REMOVE STAPLES

FOR USE IN  
RESERVE ROOM  
ONLY

*Kuanti  
Bioch 410*

NOTICE: This Material May Be Protected  
By Copyright Law (Title 17 U.S. Code)



**Exam I Fall 95  
Biochemistry 410**

Name \_\_\_\_\_  
I.D. \_\_\_\_\_

4. What is the principal type of attractive force which stabilizes the  $\alpha$  - helix or the  $\beta$  - sheet structures of proteins? (5 points)

5. Examine and complete the table given below describing the purification of a protein and answer the following questions:

Purification step	Volume (ml)	Protein (mg/ml)	Activity (Eu/ml)	Eu/mg	Total activity	fold purification	% recovery
Crude extract	500	12000	50000	4.17	25000000	0.00	100.00
Ammonium sulfate ion exchange	350	2500	48000	19.20	16800000	4.61	67.20
molecular sieve	50	350	40000	114.29	2000000	5.95	8.00
Affinity column	50	15	50000	3333.33	2500000		
	5	1	38000	38000.00	190000		

a. Which individual step gave the greatest purification? (3 points)

b. Other than the preparation of the crude extract, which step gave the highest recovery? (3 points)

c. Speculate on why you get an increase in the total activity recovered when purifying your protein through the molecular sieve column? (4 points)