EXAM	2
CHEM	160A

Name	
October 22, 2004	

Partial credit is possible on all problems, but ONLY if you show your work.

ı a	tual credit is possible on an problems, but ONL1 if you show your work.
1)	(5 points) Could a life form that evolved on earth survive on a planet where all proteins were made of D-amino acids? Why or why not?
2)	(5 points) Name five amino acids that are likely to be found on the outside of a globular (soluble) protein. Explain your reasoning.
3)	(5 points) What is the biological significance of invariant residues in homologous proteins?

4)	(5 points) What constitutes a conservative substitution for an amino acid residue in a protein?
5)	(5 points) List three methods of determining the molecular mass of a protein. Which is the most accurate, and why?
6)	(6 points) What is the amino acid sequence of the polypeptide that gives the following fragments when cleaved by the given proteases? a) trypsin i) DLVNALYK ii) DPWTM iii) IAYGVR iv) GFR v) TTGWICGK
	b) Pepsin i) FRDLVNAL ii) WICGKIA iii) TTG iv) WTM v) YGVRG vi) YKDP

7)	(10 points) Describe the <u>similarities and differences</u> between <u>denaturing gel electrophoresis</u> and <u>gel filtration column chromatography</u> .
8)	(10 points) Describe the similarities and differences between notive gel electrophorosis and denoturing gel
8)	(10 points) Describe the <u>similarities and differences</u> between <u>native gel electrophoresis</u> and <u>denaturing gel electrophoresis</u> . In your discussion, address the reagents used in each type of electrophoresis and why these reagents affect the basis of separation of proteins.

9)	(4 p	points) Draw a peptide bond. Show which bond is described by ψ and which bond is described by ϕ .
10)	(1 p	point) Which amino acid would allow the most structural flexibility when it's in a protein?
11)		points) Define the following terms as they apply to protein structure. lude the type(s) of bonds or interactions that stabilize each level of structure.
	a)	primary structure
	b)	secondary structure
	c)	tertiary structure
	d)	quaternary structure

(5 points) Under physiological conditions, polyarginine assumes a random coil conformation. Under what conditions might it form an α-helix? Explain your reasoning.	ıt
13) (5 points) Describe the energy and entropy changes that occur during protein folding.	
(5 points) Explain how the side chains of amino acid residues contribute to secondary structure, even thou they do not participate in hydrogen bonding.	ugh

15)	(5 points) Describe the characteristics of the side chains of amino acid residues that would be found in a β sheet.
16)	(6 points) Draw an antiparallel a β sheet involving two β strands.
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17)	(2 points) What is the difference between a motif and a domain?
1,,	(2 points) what is the difference between a motif and a domain.