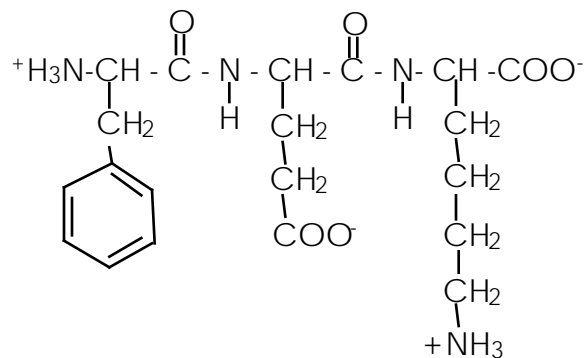


## Chapter 4 Chapter Answers

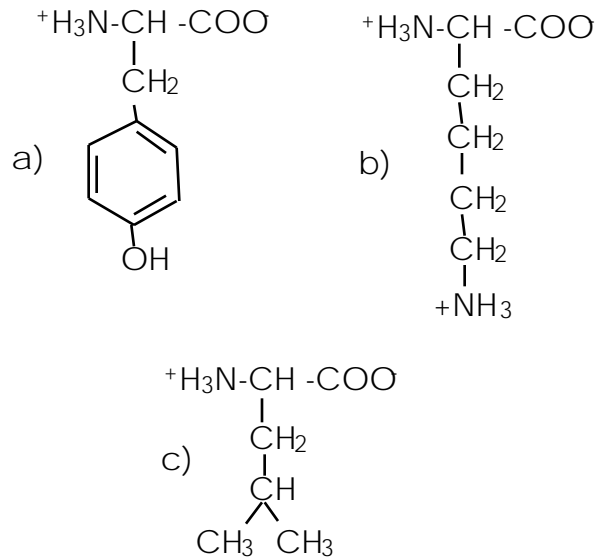
- 1 At pH 7.0, histadine would be: **See chapter 1/2 answers**
- 2 The isoelectric point for lys is (pKa1= 3.1, pKa2= 8.0, pKa3 =10.3)  
**This problem is not covered as we omitted this info in class**
- 3 The interaction between two phenylalanine amino acids are? **See last chapter answers**
- 4 Which amino acids absorb in the ultraviolet portion of the spectrum? **This question speaks to the fact that three amino acids, Phe, Tyr, Trp all absorb about at 280 nm and that we can also measure the absorbance of a protein at the 254 nm wavelength by the absorbance at the peptide bond.**
- 5 Why is it that mutations that mutate a lys to a arg and lle to a leu often have little effect on a proteins function while an asp to glycine mutation would greatly effect a proteins function **The point of this question is to focus on where in a protein you would expect to find hydrophobic or hydrophilic amino acids. Those that are unable to hydrogen bond or form salt bridges (ionic bonds) are usually hydrophobic and found buried inside of a protein while those hydrophilic amino acids are found on the surface of a protein where the side chains can interact with the water and other proteins. So... if you look at the kind of an amino acid that Lys is and the conserved amino acids mutations that arg, leu and lle are you see that the type of functional group is about the same. While there may be some differences between these amino acids, there is a much greater problem when you replace acidic asp with glycine. Thing of what would happen if this did take place. I.e. what are the consequences of the protein shape when this happens.**
- 6 Which of the following peptides would be found in the interior portion of a protein?  
 A) Met-Val-Ile-Phe \*\*\*\*  
 B) Asp-Glu-Gln-Asp  
**See the above question for insight into this answer.**
- 7 The overall charge of the following peptide sequence at pH 12 would be:



**Look at 1) the C and N terminus and then 2) each of the side chains. Predict the charge at the indicated pH and sum the charges.**

a) -3	d) +1
b) -2 ****	e) +2
c) -1	f) +3

Consider the three amino acid shown below for questions 8 - 10



8) Which amino acid is most likely to be involved in a chemical reaction such as phosphorylation?

a) a ***	b) b
c) c	d) a and b
e) None of the above	

9) Which amino acid has an acidic side chain

a) a	b) b
c) c ****	d) None of the above ***

**The charge on B will decrease the ability for this amino acid to form strong hydrophobic interactions.**

10) Which amino acid has a side chain that can form hydrophobic interactions

a) a	b) b
c) c	d) b and c
e) None of the above	

11) A glutamate in hemoglobin is sometimes mutated to a valine. If this is an exterior facing amino acid, what are the possible consequences of this mutation?