<Q>The partial negative charge at one end of a water molecule is attracted to the partial positive charge of another water molecule. This attraction is called:

<S>Y

<C>a hydrogen shell.

<C>a covalent bond.

<C>an ion-dipole interaction.

<C+>a hydrogen bond.

<Q>Which of the following statements is true ?

<S>Y

<C>Hydrogen bonds are stronger than normal covalent bonds.

<C>Water can form two hydrogen bonds.

<C>Ammonia has higher boiling point than water.

<C+>An acid is a molecule that acts as a proton donor.

<Q>Which of the following NaOH solutions has the highest pH value?

<S>Y

<C>0.5 M.

<C+>0.8M.

<C>0.3 M.

<C>0.6 M.

<Q>Any buffer will have a maximum buffering capacity when the ratio of [base form] /[acid

form] equals:

<S>Y

<C>1/1000.

<C>1/100.

<C>100/1.

<C+>1/1.

<Q>Which of the following is the strongest acid?

<S>Y

<C>Acetic acid (pKa = 4.76).

<C>Formic acid (pKa = 3.75).

<C+>Pyruvic acid (pKa = 2.50).

<C>Carbonic acid (pKa = 6.37).

<Q>The equation pH = pKa + log [acid] / [conjugate base] ?

<S>Y

<C>is known as the Henderson-Hasselbalch equation.

<C>applies to strong acids.

<C+>is incorrect.

<C>assumes that water ionizes.

<Q>The amphipathic molecule in the list below is

<S>Y

<C>sodium chloride

<C>acetic acid

<C>benzene

<C+>sodium plamitate

<Q>Ionic compounds and polar covalent compounds tend to dissolve in water because of

<S>Y

<C+>ion-dipole and dipole-dipole interactions

<C>dipole-induced dipole interactions

<C>van der Waals bonds

<C>hydrophobic interactions

<Q>The partial negative charge at one end of a water molecule is attracted to the positive charge of a cation. This attraction is called:

<S>Y

<C>a hydrogen shell.

<C>a covalent bond.

<C+>an ion-dipole interaction.

<C>a hydrogen bond.

<Q>Which of the following statements is CORRECT about the hydrogen bond?

<S>Y

<C>it is formed only between water molecules

<C>it is important for stabilization of the quaternary structure of dipeptides

<C>it can be formed between water and benzene

<C+>could be linear or nonlinear

<Q>Which of the following statements is true ?

<S>Y

<C>Hydrogen bonds are stronger than normal covalent bonds.

<C>Water can form two hydrogen bonds.

<C>Ammonia has higher boiling point than water.

<C+>A base is a molecule that acts as a proton acceptor.

<Q>The suitable buffer range for acetic acid pKa= 4.76 and its sodium salt is

<S>Y

<C>Cannot be determined without giving the pKa of sodium acetate

<C>4.76

<C+>3.76-5.76

<C>4.76±0.5

<Q>Any buffer will have a maximum buffering capacity when:

<S>Y

<C>it contains low amounts of both the acid and the base.

<C>it contains low amounts of the acid and high amounts of the base

<C+>it contains high amounts of both the acid and the base.

<C>it contains high amounts of the acid and low amounts of the base.

<Q>Which of the following is the weakest acid?

<S>Y

<C>Acetic acid (pKa = 4.76).

<C>Formic acid (pKa = 3.75).

<C>Pyruvic acid (pKa = 2.50).

<C+>Carbonic acid (pKa = 6.37).

<Q>The equation pH = pKa + log [conjugate base] / [acid]

<S>Y

<C+>is known as the Henderson-Hasselbalch equation.

<C>applies to strong acids.

<C>is incorrect.

<C>assumes that water ionizes.

<Q>Hydrogen bond can be formed between each of the following pairs of groups EXCEPT

<S>Y

<C>O-H and O=C

<C>N-H and O=C

<C>N-H and N=

<C+>O-H and C-H

<Q>Which of the following statements is CORRECT?

<S>Y

<C>Hydrogen bonds are stronger than normal covalent bonds.

<C>Water molecule can form maximum two hydrogen bonds.

<C+>Ammonia has lower boiling point than water.

<C>A base is a molecule that acts as a proton donor.

<Q>Which of the following HCl solutions has the lowest pH value?

<S>Y

<C>0.5 M.

<C+>0.9 M.

<C>0.3 M.

<C>0.7 M.

<Q>The buffering region for any buffer is at:

<S>Y

<C>pH= pKa ± 3

<C>pH= pKa ± 2

<C+>pH= pKa ± 1

<C>pH= pKa

<Q>Buffer solutions

<S>Y

<C>will always have a pH of 7

<C>cause a significant increase in pH when small amounts of strong bases are added to them.

<C>are rarely found in living systems.

<C+>tend to resist changes in pH upon addition of small amounts of strong bases or strong acids

<Q>The ratio of the base form to the acid form to make a good buffering is:

<S>Y

<C>1/100

<C>100/1

<C+>1/1

<C>1000/1

<Q>Which of the following acid/conjugate base pairs has the highest buffering capacity at pH 7.4?

<S>Y

<C>Lactic acid/lactate ion, pKa = 3.86.

<C+>Monobasic phosphate/dibasic phosphate, pKa = 6.86.

<C>Acetic acid/acetate ion, pKa = 4.76.

<C>Bicarbonate ion/carbonate ion, pKa = 10.25.

<Q>The enzyme that have maximum activity near pH 5 is:

<S>Y

<C>trypsin

<C+>lysozyme

<C>pepsin

<C>chymotrypsin

<Q>Which of the following statements is correct?

<S>Y

<C+>The buffering system in blood is based on the dissociation of carbonic acid.

<C>The buffering system in blood is based on the dissociation of phosphoric acid.

<C>At pH values below the pKa, the basic form predominates.

<C>The smaller the Ka value, the stronger the acid.

<Q>Which of the following compounds form micelles in water?

<S>Y

<C>oleic acid

<C>cholesterol

<C>acetone

<C+>sodium palmitate

<Q>The enzyme that have the highest activity at pH around 2 is

<S>Y

<C>trypsin

<C>lysozyme

<C+>pepsin

<C>chymotrypsin

<Q>Amphipathic molecule is:

<S>Y

<C>A water-loving molecule.

<C>A water-hating molecule.

<C+>A molecule that has both hydrophilic and hydrophobic properties.

<C>A non-polar molecule.

<Q>At the midpoint of a titration curve:

<S>N

<C>the concentration of a conjugate base is equal to the concentration of a conjugate acid

<C>the pH equals the pKa

<C>the ability of the solution to buffer is best

<C+>All of the above

<Q>The Henderson-Hasselbalch equation can be used to calculate:

<S>N

<C>the pH of a solution of an organic acid.

<C>the amount of salt and acid to add to form a specific buffer.

<C>the pKa of a weak acid.

<C+>All of the above

<Q>Molecules that are both hydrophobic and hydrophilic are _____.

<S>Y

<C+>amphipathic

<C>amphoteric

<C>bipolar

<C>not possible

<Q>What is the maximum number of hydrogen bonds that one water molecule can have with

neighboring water molecules?

<S>Y

<C>1

<C>2

<C>3

<C+>4