King Saud University
CLS Department
CLS 232

CLS 232 – midterm exam

Name:..... Univ. No#.....

Question 1: Choose the best answer from the options underneath each question below: (8 marks)

1- The hydrogen ion concentration of a solution would determined its

A. polarity

B. temperature

C. pH

D. reaction rate

2- The linkages that holds polypeptide chains together within the secondary structure of a protein are _____ bonds

A. peptide **B.** covalent

C. ionic **D.** hydrogen

3- A buffer solution is composed up of

A. A weak acid

B. A weak base

C. A weak acid + a strong base

D. A weak acid + a weak base + H^+

4- What is the concentration, in moles/liter, of the hydrogen ion, if the pH of a solution is 7?

A. 7

B. 7×10^{-7}

C. 5×10^{-7}

D. 1×10^{-7}

5- Which of the following natural buffers (acid/base pairs) is the most powerful extracellular buffer system in the human body?

A. H_2CO_3/HCO_3^-

B. $H_2PO_4^-/HPO_4^{2-}$

C. $Histidine^+$/histidine

D. Hemoglobin/Albumin

6- The 3D spatial configuration of multiple polypeptide chains, and how these sub-units fit together (e.g. the 4 chains of haemoglobin) describes the proteins':

A. Primary structure

B. Tertiary structure

C. Quaternary structure

D. Secondary structure

7- A covalent bond is

A. A bond where electrons (e^-) are unevenly distributed

B. a bond where e^- are shared between atoms with similar electronegativity

C. a bond where e^- are attracted to each other between atoms with large differences in electronegativity

D. between two amino acids, between amino and carboxylic acid groups

8- The difference between oxidants (e.g. O_2) and reductants (e.g. Fe^{2+}) is that:

A. reductants are polar molecules and oxidants are not

B. oxidants are polar molecules and reductants are not

C. oxidants accept (e^-) while reductants donate them

D. reductants accept (e^-) while oxidants donate them

Question 2: Complete the statements below with appropriate answers:

(16 marks)

1- The major organs involved in regulating physiological pH are the lungs which eliminate _____ and the kidneys which excrete _____, in order to keep pH within the range (pH= 7.35-7.45) via the _____ buffer system.

2- Acids that readily dissociates in water to release protons (H^+) are known as strong acids, (e.g.) _____, whereas weak acids do not readily dissociate in water (e.g.) _____.

3- The arrangement of amino acid residues along the linear sequence of a polypeptide chain defines the protein's _____ structure.

4- The geometric 3D arrangement of a single polypeptide chain by hydrogen bonds, van der Walls forces and other electrostatic linkages represents protein _____ structure.

5- Aromatic amino acids are considered hydrophobic, except _____ which has a _____ group attached to phenyl on its side chain.

6- Alanine is one of the smallest amino acid, as its side chain (R group) = _____.

7- In regard to pH, diamino, monocarboxylic amino acids are considered to have _____ side chains –in terms of pH-, because they contain a single carboxylic acid group vs. two amino group. One example of this category of amino acids is _____.

8- Cysteine and selenocysteine are amino acids similar in their structure, except that cysteine contains _____ in its side chain, which is replaced by selenium in selenocysteine.

9- Oils are considered hydrocarbons; organic compounds made up of atoms of _____ and _____. As these compounds are non-polar, they are described as being _____ in relation to their reactions with water.

ALL THE BEST „„