

الإجابة النموذجية لامتحان الكربوهيدرات والأحماض الأمينية والليبيدات

419 ك

(نصف ورقة امتحانية)

الفرقة : الرابعة

الشعبة : ميكرو وكيمياء

التاريخ : الأربعاء 11 / 1 / 2017

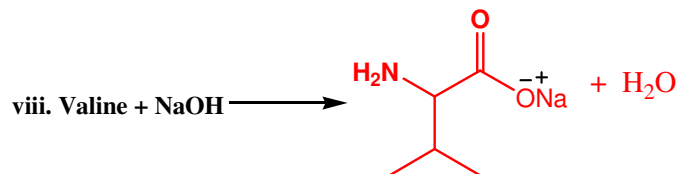
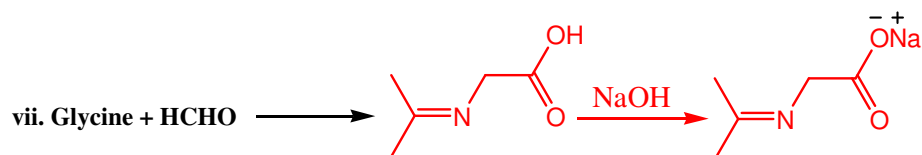
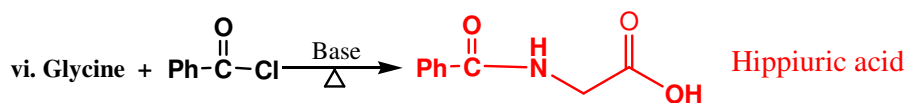
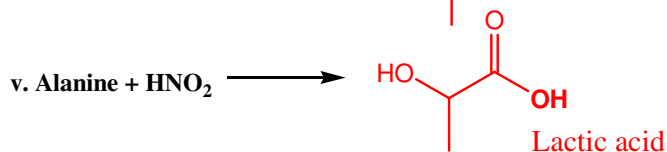
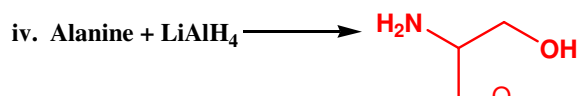
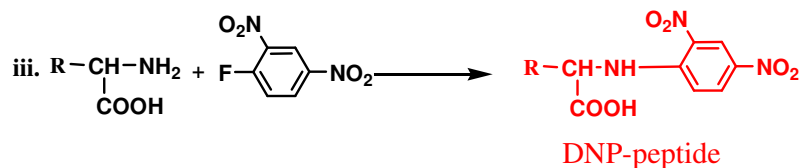
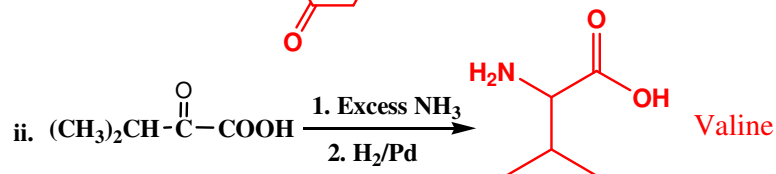
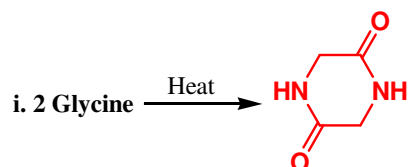
الممتحن : د/ عبد المتعال عبدالمجيد الشيخ

قسم : الكيمياء

كلية : العلوم

3. a. Complete the following equations: (Select only Six):

[3 Marks]

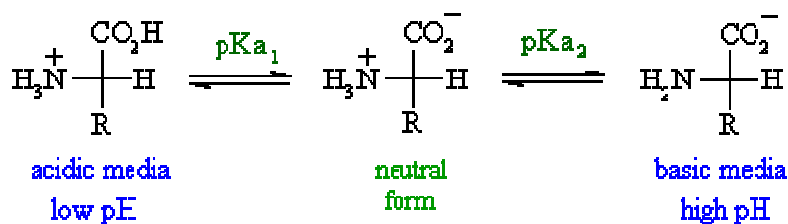


B. Define each of the following terms:

[3 Marks]

- i. **Isoelectric point:** pI, IEP, is the pH at which a particular molecule (amino acid or protein) carries no net electrical charge in the statistical mean. And cease (does

not) migrate towards any electrodes in an electric field i.e. the zwitterion form is dominant.

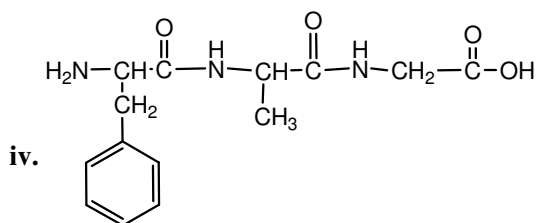
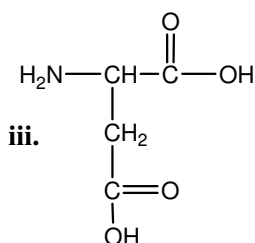
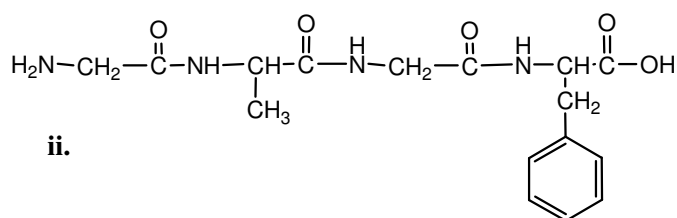
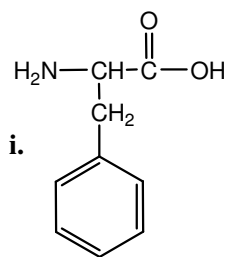


IEP(net charge = 0)

ii. Polypeptide: a linear organic polymer consisting of a large number of amino-acid residues bonded together in a chain by peptide bonds, forming part of (or the whole of) a protein molecule, and having a molecular weight up to about 10,000.

iii. Protein: Large biomolecules, or macromolecules, composed of one or more chains of amino acids (more than 100) in a specific order determined by the base sequence of nucleotides in the DNA coding for the protein. Proteins are required for the structure, function, and regulation of the body's cells, tissues, and organs.

C. Draw the complete structures of the following. (Select only Three) [3 Marks]

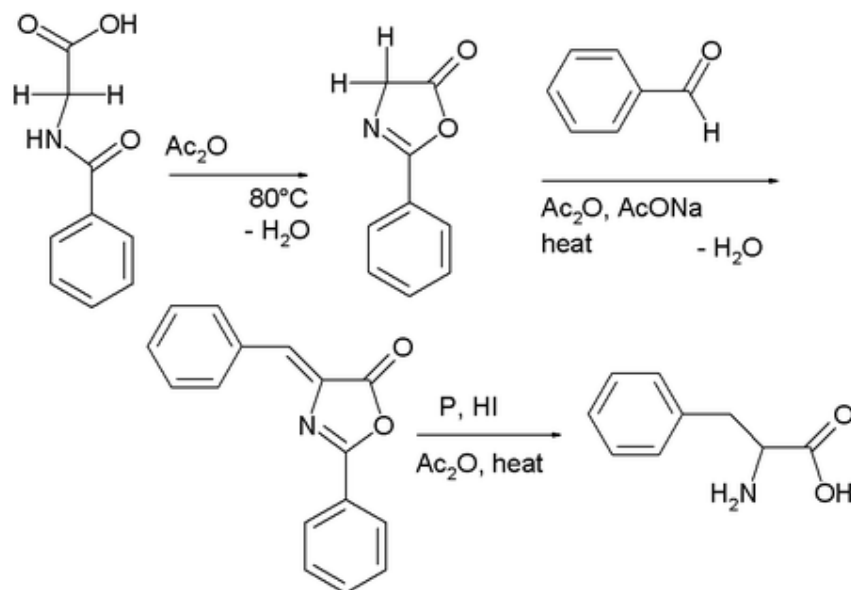


4. Answer Three points only

(A is obligatory)

A. Describe how can you synthesize each of the following: (Select only Three) [6 Marks]

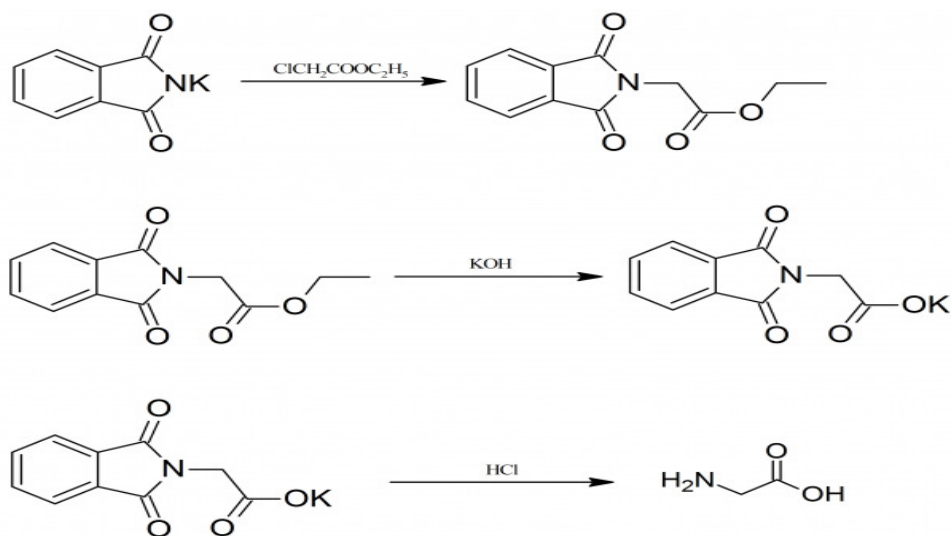
i. Phenylalanine:



ii. Glycine:

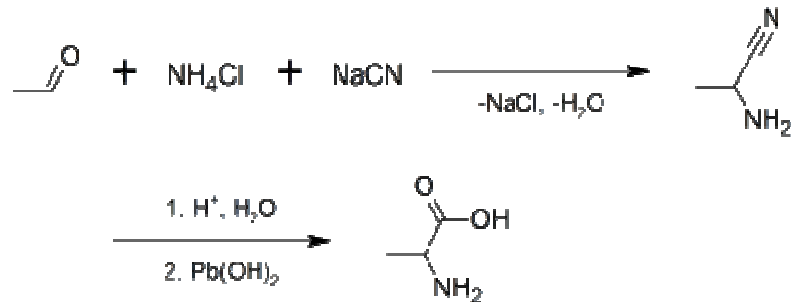


Method B:



iii. Alanine

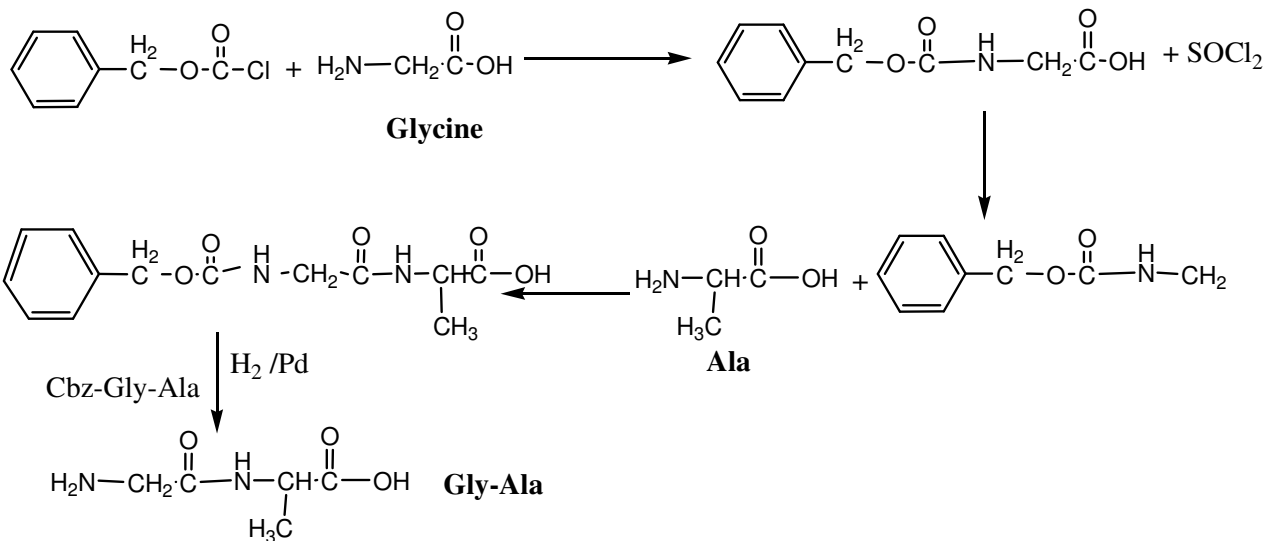
Method A:



Method B



iv. Gly-Ala



B. After treatment with peroxyformic acid, the neuropeptides peptide hormone Oxytocin is partially hydrolyzed. The following fragments are recovered. **Propose a structure for Oxytocin.** [3 Marks]

Answer:



C. Amino acids are classified in different ways? Discuss their classification according to their synthesis and structure? Illustrate your answer by examples? [3Marks]

Answer:

****They can be classified according to their synthesis as:**

i. **Essential**: Amino acids that can not be synthesized by human body and must be supplied in their diet.

Ex. Valine, leucine, phenylalanine, etc.

ii. **Non-essential**: Amino acids that can be synthesized from other compounds by tissues of the body.

Ex. Glycine, Alanine, tyrosine, serine, cysteine,.....etc.

Or they can be classified according to relative number of amino and carboxylic group.

i. **Neutral**: Amino acids which contain in their structure one NH_2 group and one carboxylic group (COOH).

Ex. Glycine, Ala, Valine, leucine , tyrosine, serine,etc.

ii. **Acidic**: Amino acids which contain in their structure one NH_2 group and two carboxylic group (COOH).

Ex. Aspartic acid and Glutamic acid

iii. **Basic**: Amino acids which contain in their structure two NH_2 group and one carboxylic group (COOH).

Ex. Lysine and Histidine

D. Draw the structure of the predominant form of a mixture of Aspartic acid, Alanine, and Lysine at pH 6. Draw their electrophoretic separation at the same pH. [3 Marks]

Structure at pH 6

