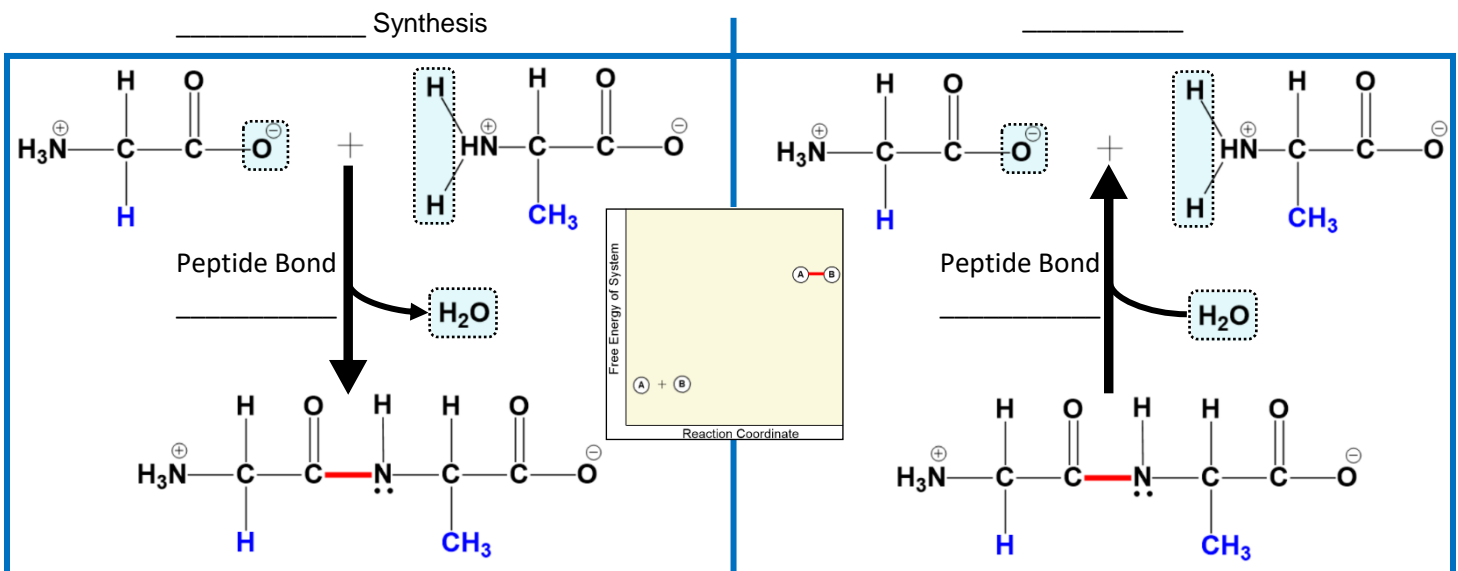<u>CONCEPT:</u> PEPTIDE BOND

● Free amino acids can be linked together via _____ bonds.

   □ *Peptide Bonds*: the _____ covalent linkages between amino acids in a polypeptide chain.

   □ Total # of peptide bonds is ____ less than the total # of amino acids in a chain.

● Peptide bonds form via *endergonic* _____ synthesis reactions.

   □ Molecule is dehydrated by losing _____ during peptide bond formation.

   □ *Hydrolysis*: the _____ *exergonic* reaction that cleaves a peptide bond.

<u>EXAMPLE:</u> Peptide Bond Formation & Breakdown. Circle the α-carbons (C_α).

_____ Synthesis   _____

PRACTICE: Considering that peptide bond hydrolysis is exergonic, how is the stability of a peptide bond accounted for?

   a) Despite the thermodynamic favorability of hydrolysis, peptide bond formation is more favorable.

   b) The numerous peptide bonds in a typical protein synergistically make hydrolysis unfavorable.

   c) Peptide bonds are only stable and avoid hydrolysis in cellular environments.

   d) Though peptide bond hydrolysis is thermodynamically favorable, there is a high energy of activation.

PRACTICE: Highlight the peptide bonds in the figure below & circle all the α-carbons. How many peptide bonds are there?
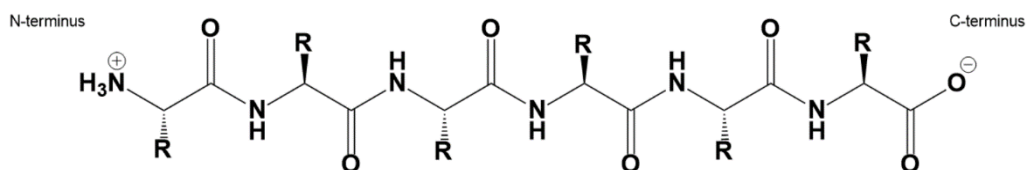
   a) 3   b) 4   c) 5   d) 6

<u>**CONCEPT:**</u> PEPTIDE BOND

PRACTICE: Which of the following best represents the backbone atom arrangement of two peptide bonds?

      a) C_α----N----C_α----C----C_α----N----C_α----C.

      b) C_α----N----C----C----N----C_α.

      c) C----N----C_α----C_α----C----N.

      d) C_α----C----N----C_α----C----N.

      e) C_α----C_α----C----N----C_α----C_α----C.

PRACTICE: Circle all the peptide bonds in the tripeptide structure below?