

Concepts of Science    **NAME**\_\_\_\_\_

Exam 2 October 25, 1994    **Class Time**\_\_\_\_\_    **Lab Sec.**\_\_\_\_\_

**Seat No.**\_\_\_\_\_

**When Solving Problems, be sure to show all work**

1. Briefly define or explain the significance of the following terms or people. (30%)

a. Covalent bond

b. Base pairing

c. Polymer

d. DNA fingerprinting

e. Watson and Crick

g. Enzyme

2. Cellulose and starch are two naturally occurring polymers of glucose.

a. Where do we find each of these molecules.

b. Which polymer is lower in energy. Briefly explain why

c. While it is relatively easy to break down starch into its glucose molecules and utilize the energy in the glucose, it is much harder to do this with cellulose. Briefly explain why.

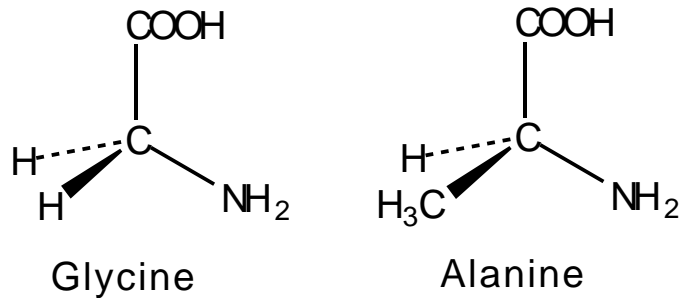
d. Name an animal that can utilize cellulose as an energy source. How does it do this?

3. In the space below, draw a diagram that shows how the information stored in DNA is used to synthesize a protein. Labels on the diagram should include the words translation, enzyme and transcription.

4. Write a phrase after each molecule below that describes its function in the cell.

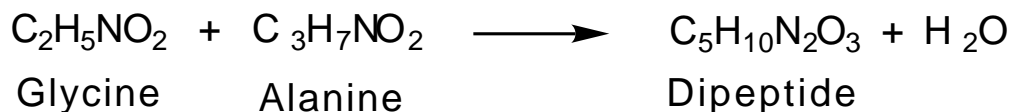
- a. DNA\_
- b. Protein
- c. Fat
- d. m-RNA

5. Two amino acids, glycine and alanine, are shown below.



- a. Which is chiral? Briefly explain your answer.
- b. Calculate the molecular weight of each amino acid.

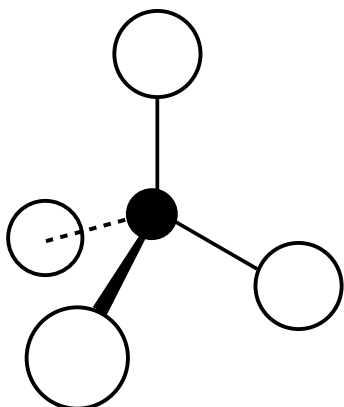
c. Glycine and alanine can be combined to form a dipeptide as shown below:



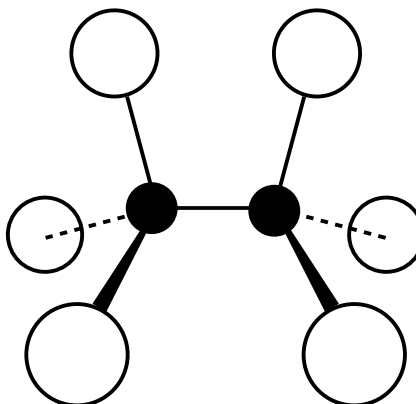
Calculate how many grams of glycine are necessary to combine with 100 g of alanine.

6. Simulate color on the open balls on the structures below by adding the letters R (red), B(blue), G(green), and Y(yellow) to achieve the desired effect. (Colors may be used more than once).

Make achiral



Make chiral



7. Deduce the sequence of a pentapeptide which is hydrolysed to the di and tripeptides below. (5%)

