

BRING TO CLASS ON EXAM DAY: Scan-Tron Form 883, #2 pencil, and eraser

Material Covered on Exam:

Chemistry: assigned reading for Unit 5

Lab Manual: Experiments 12, 13

Exercise 13

A. LIPIDS

1. Know the general definition of lipids.
2. Know the components of the various classes of lipids and the types of linkages between them.
3. Know the structural properties of fatty acids.
4. Know the relationship between degree of unsaturation and melting point of a fatty acid.
5. Know the physical and chemical properties of triglycerides.
6. Know the products of the saponification of a triglyceride.
7. Know the names of amino alcohol groups of lecithins and cephalins.
8. Given several structures, identify the one that is the steroid nucleus.

B. CARBOHYDRATES

1. Given the names of mono-, di-, or polysaccharides, tell which are reducing sugars.
2. Given structures (Fischer projections) for monosaccharides:
  - a. Identify an aldose or ketose; a tri-, tetra-, pent-, or hexose.
  - b. Identify which one is glucose, galactose, or fructose.
  - c. Calculate the number of possible stereoisomers.
  - d. Determine which is an L- or D- isomer.
3. Given the Haworth structure of a mono- or disaccharide, determine if it is the  $\alpha$  or  $\beta$  anomer.
4. Given the Haworth structure of a disaccharide, recognize the type of glycosidic linkage.
5. Know whether the polysaccharides glycogen, starch and cellulose are composed of alpha or beta glucose units - that is - know if the glycosidic linkage is  $\alpha$ -1,4 or  $\beta$ -1,4, and so on.
6. Know the products of hydrolysis of di- and polysaccharides.
7. Given a list of names of carbohydrates, determine which one cannot be hydrolyzed internally by humans.
8. Know how glycogen and amylopectin are alike.

C. PROTEINS

1. Determine whether or not an amino acid contains a peptide bond.
2. Know which amino acids (hydrophobic or hydrophilic) are found on the interior and which on the exterior of globular proteins.
3. Know the properties of free amino acids.
4. Identify the monomer (repeating unit) of a protein.
5. Know if there is a difference between a peptide bond and an amide linkage.
6. Know whether a protein can be hydrolyzed (lose 1° structure) by heating.
7. Denaturation
  - a. Know methods of protein denaturation.
  - b. Know effects of denaturation on primary, secondary, tertiary and quaternary structure.
  - c. Know effect of denaturation on protein conformation and biological activity.
8. Define primary, secondary, tertiary and quaternary structure of proteins.
9. Know the forces that maintain primary, secondary and tertiary structures.
10. Know characteristics of fibrous vs. globular proteins.

D. NUCLEIC ACIDS

1. Know what the monomer (repeating unit) is in nucleic acids.
2. Know function of nucleic acids.

E. VOCABULARY

triglycerides  
phosphoglycerides  
sphingolipids  
glycolipids  
steroids  
fat-soluble vitamins  
fatty acid  
amphipathic  
hydrolysis  
saponification  
rancid  
lecithin  
cephalin  
cerebroside  
ganglioside  
steroid nucleus  
lipid bilayer  
membrane

carbohydrate  
polymer  
monomer  
monosaccharide  
disaccharide  
polysaccharide  
ketose  
aldose  
triose  
tetrose  
pentose  
hexose  
asymmetric carbon  
hemiacetal  
glycosidic linkage  
reducing sugar

protein  
enzyme  
amino acid  
amphoteric  
zwitterion  
buffer  
fibrous protein  
globular protein  
denaturation