

The final exam will be broken into two parts. Part I covering organic chemistry will be over chapters 19-26, and Part II covering biochemistry will be over chapters 27-35.

Chapter 19-25: Organic Chemistry

1. Naming structures
2. Drawing structures given names
3. Predict which compound will have a higher boiling point or melting point and which are more or less soluble
4. General properties of each class of compound
5. IMF's

Chapter 19: Saturated Hydrocarbons

1. Table 19.1 on page 501
2. Substitution reactions

Chapter 20: Unsaturated Hydrocarbons

1. Cis and Trans Isomers
2. Addition reactions
3. Markovnikov's Rule

Chapter 22: Alcohols and Ethers

1. Primary, Secondary and Tertiary
2. Hydrogen Bonding
3. Oxidation and Reduction reactions
4. Esterification (Dehydration)

Chapter 23: Aldehydes and Ketones

1. Hemiacetal, hemiketal, acetal, ketal structures
2. Oxidation and Reduction reactions

Chapter 24: Carboxylic Acids and Esters

1. Acid Properties
2. Oxidation and Reduction reactions
3. Esterification (Dehydration)
4. Hydrolysis of Esters
5. Glycerol Esters and Soaps

Chapter 25: Amines and Amides

1. Base properties
2. Hydrogen Bonding
3. Dehydration reaction (formation of amides)

Chapter 26: Stereoisomerism

1. Optical Activity
2. Chiral carbons
3. Enantiomers and Diastereoisomers

Chapter 27-35: Biochemistry

1. Identify, Draw and Name the different classes of molecules
2. Important use for each type of molecule
3. Identify functional groups on molecules
4. Key property(s) of each class of compound
5. Formation reaction and type of bonds formed for each class of molecules
6. General properties/use of each class of molecules (Why are they important)

Chapter 27: Carbohydrates

1. Nomenclature: Aldose/Ketose, # Carbons, D/L isomers, Anomers (α and β), furanose, pyranose.
2. Fischer projections and Haworth projections
3. Properties of monosaccharides, disaccharides and polysaccharides

Chapter 28: Lipids

1. Structures
2. ω -3/ ω -6, saturated/unsaturated properties
3. Hydrophobic/Hydrophilic parts
4. Energy property/content of Carbohydrates, Fatty Acids and Proteins

Chapter 29: Amino acids and Proteins

1. Structure of AA and Peptides
2. Hydrophobic/Hydrophilic/Acidic/Basic R groups
3. Protein structure (Primary, Secondary, Tertiary, Quaternary)
4. Hydrogen bonds/Disulfide Bonds, Salt Bridges, Hydrophobic, Hydrophilic
5. α -helix, β -pleated sheets

Chapter 30: Enzymes

1. Activation Energy, Transition State, Enzyme Catalysed Reaction
2. Effect of pH and Temperature
3. Enzymes as Dynamic Catalysts - Active Site, Lock-an-Key, Induced-Fit, Proximity Catalysis, Productive Binding, Strain Hypothesis

Chapter 31: Nucleic Acids and Heredity

1. ATP and high energy phosphate bonds
2. Structure of DNA (bases, sugars, phosphate groups)
3. Compare and Contrast DNA/RNA
4. Role of DNA/mRNA/rRNA/tRNA

Chapter 32: Nutrition

1. Macro/Micro nutrients
2. Vitamins/Minerals
3. 6 Food Groups
4. Essential
5. Primary use of each nutrient

Chapter 33: Bioenergetics

1. Catabolism vs Anabolism
2. Oxidation and Reduction
3. Oxidation numbers
4. Recognize energy conenzymes and energy transfer processes.

Chapter 34: Carbohydrate

1. Embden-Meyerhof pathway for anaerobic breakdown of glucose
2. Identify important chemical steps (oxid/red)
3. Identify energy transfer steps

Chapter 35: Metabolism of Lipids and Proteins

1. Fatty acid oxidation (Beta-oxidation)
2. Identify important chemical steps (oxid/red)
3. Identify energy transfer steps
4. Lipogenesis