

BIOLOGY 181- Final Exam Review Notes

Introductory

Characteristics of Live and of Living Organisms.

All Animals are Heterotrophs.

Plants are multicellular producers or Autotrophs.

Steps of the Scientific Method.

Inorganic and Organic Chemistry

Where in the atoms neutrons, protons, and electrons are located.

Definition of Atom.

Most abundant elements in living organisms.

Chemical Bonds: Ionic, Covalent (Polar and Non-polar, and Hydrogen Bonding)

In a covalent bond, electrons are shared.

Categories of Macromolecules: carbohydrates, lipids, proteins, and nucleic acids.

Glucose and Fructose are carbohydrates.

Cell Structure and Function. Cell Membrane Structure and Function

Function of the Golgi Apparatus.

Function of Ribosomes (protein synthesis).

Function of Mitochondria (provide energy, perform aerobic respiration).

Plant Cells and Bacteria have Cell Wall.

Functions of the Cell Membrane (traffic of substances, maintains overall shape of the cell, provides protection for the cell).

Major constituents of the cell membrane (phospholipids and membrane associated proteins).

Monerans (Bacteria) are prokaryotes

Enzymes and ATP/ADP

Properties of Enzymes (proteins that speed up chemical reactions).

What is an enzyme's competitive inhibitor.

Enzyme's active site and allosteric site

ATP: constituents of the molecule. The main energy carrier.

REDOX reactions: what are they.

Photosynthesis

Reactants of the light-dependent reactions (carbon dioxide + water)

Study the main events occurring in the two stages of photosynthesis (light-dependent and light-independent).

First step of photosynthesis: an electron is excited by a photon, raises to a higher energy level, releases energy, and then comes back to the energy level where it was in initially.

The energy required to run the light-independent reactions of photosynthesis comes from the products produced in the light-dependent reactions.

Aerobic Respiration

The greatest ATP yield in Aerobic Respiration comes from phosphorylation during the Electron Transport System (chemiosmosis).

Glycolysis yields 2 ATP's; Krebs's Cycle yields 2ATP's; chemiosmosis yields 32 ATP's.

The first step of the metabolism of carbohydrates (sugar) involves the splitting of the 6C molecule of glucose.

Definition of Aerobe and Anaerobe Organism.

DNA Structure, DNA Duplication, Protein Synthesis

Nucleic Acids are made of nucleotides

DNA bases: A, T, G, C.

Hydrogen Bonds bond purines to pyrimidines.

DNA replication occurs before the cell enters cell division.

Transcription is the copy of a piece of DNA into a molecule of mRNA.

Definition of a gene: a segment of DNA that codes for a specific protein.

Be proficient in identifying DNA complementary strands and mRNA strands that complement a specific DNA strand.

Definition of an mRNA codon: made of 3 nucleotides.

The correct path for code transfer in protein synthesis is DNA – mRNA – tRNA.

Translation is the conversion of mRNA into proteins.

Polypeptides are stretches of amino acids bonded by peptide bonds.

DNA bases (A, T, G, C) and RNA bases (A, U, G, C)

Definition of an anticodon.

Cell Cycle, Mitosis, and Meiosis

Daughter cells originated from mitosis are genetically identical to the mother cell and to each other.

Study the main steps of Mitosis.

Study the main steps of Meiosis.

Differences between Asexual (only one parent) and Sexual (two parents) reproduction.

Meiosis involves only the production of sexual cells or gamete formation.

Genetic Crosses, Dominance Relationships

Definition of Haploid Cells and Diploid Cells

Difference between a Monohybrid Cross and a Dihybrid Cross.

Autosomal genes and Sex-linked genes.

Be proficient in doing monohybrid and dihybrid crosses

Human Blood Typing is an Example of Codominance. AB typing is an example of codominant alleles.

Sex-linked diseases and conditions: hemophilia, baldness, colorblindness.