SBI4U Exam Terms and Concepts 2025

HOMEOSTASIS

Topic
Feedback Systems – homeostasis, positive feedback loops, negative feedback loops, receptors, integrators, effectors
Regulating Blood Sugar – feedback diagram, diabetes, antagonistic hormones, insulin, glucagon **Dry Lab - Blood Sugar**
The Kidneys – urinary system structures, 5 functions of kidneys, kidney structures and function
Dissection of kidney- activity The Nephron – structure/function of all the parts of the nephron
Urine Formation – 4 steps (filtration, reabsorption, tubular secretion, excretion) and how counter-current flow of urine to blood ensures maximum water reabsorption
Water Balance: Blood osmotic pressure and ADH (solute concentrations) and Blood pressure (blood volume) and aldosterone
The Nervous System – structures and functions - sympathetic, parasympathetic, somatic, autonomic, and the Reflex Arc, sensory nerve, interneuron, motor nerve
The Structure of the Neuron
lesson-Nerve Impulse or Action Potential – how information travels along a neuron (nerve cell)
14 ACTION POTENTIAL WS .doc
The Synapse – how information travels from one neuron to the next

BIOCHEMISTRY

Introduction to Biochemistry atoms, valence electrons, 4 models of atoms (electron, space filling, structural, molecular), covalent molecules, ionic compounds, organic molecules, 3 intramolecular bonds (covalent, polar covalent, ionic), electronegativity, 2 intermolecular bonds (hydrogen, van der Waals), bond energy
Types of Reactions and Functional Groups,*Water's* special properties, 4 types of reactions (dehydration synthesis, hydrolysis, neutralization, redox), 6 functional groups, (hydroxyl, carbonyl, carboxyl, amino, phosphate, sulfhydryl), monomers and polymers
Carbohydrates, monosaccharide, disaccharide, polysaccharide, isomer, glycogen, cellulose, α and β glycosidic bond
Lipids, fatty acid, glycerol, triglyceride, saturated, unsaturated, phospholipid, cholesterol, steroids, hydrophilic, hydrophobic, ester bond
Proteins, 3 main types, amino acids, R groups, polar, non-polar, peptide bond, polypeptide, primary, pleated or helix secondary structure, tertiary and quaternary structure, 4 protein functions (transport, enzymes, recognition, signaling)
Nucleic Acids, DNA, RNA, nucleotide, nitrogen bases, hydrogen bonds.
Fluid Mosaic Model of the Cell Membrane, phospholipid bilayer, integral and peripheral proteins, glycolipid, glycoprotein, 3 factors affecting fluidity (temperature, bond types, tail length), 4 protein functions (transport, enzymes, recognition, signaling)
Enzyme Function, active site, substrate, normal activation energy, catalyzed activation energy, coenzymes, cofactors, effects of temperature, pH, enzyme and substrate concentration on enzymes
Inhibition of Enzymes, competitive inhibition, non-competitive inhibition, inhibitor, allosteric site, biochemical pathways.
Osmosis and Diffusion, solute, solvent, concentration:**Homeostasis, isotonic, hypotonic, hypertonic**
Transport of Materials Across Cell Membranes A) *Passive Transport*, channel and carrier proteins B) *Active Transport*, Na+/K+ pump C) *Bulk Membrane Transport*, exocytosis, endocytosis, pinocytosis

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GENETICS

Topic
Nucleic acids and nucleotides Homework: 01 Nucleic Acid Comparison V4
DNA structure and composition, DNA coiling, semi-conservative replication
DNA Replication Initiation, elongation, termination
The Central Dogma, the triplet hypothesis, DNA transcription RNA translation protein
Protein Synthesis Step 1 – Transcription **-assignment in class- HAND IN** 05 Protein Synthesis Diagram activity pg 1.doc 05_protein_synthesis_diagram_activity_pg2.jpg
Protein Synthesis Step 2 – Translation
Genes, Genome, Introns, Exons, Splicing
Biotech part 1: Restriction Endonucleases, PCR, Gel Electrophoresis
Biotechnology Part 2 - Recombinant DNA, plasmids
Mutations classwork
Operons and Transcriptional control in Prokaryotes
2-Transcriptional Control in Eukaryotes