

BIOLOGY 121 – STUDY GUIDE FOR FINAL EXAM

COMPREHENSIVE PORTION

Organ systems and Homeostasis

Specific functions and organs of the 4 organ systems – integumentary, skeletal, muscular and nervous systems

Homeostasis - Negative versus positive feedback

Specific examples of homeostasis that occur in each of the 4 organ systems. For example – adjustment of Ca^{2+} levels in the body with the help of the skeletal system.

Chemistry

Important elements and ions in the human body.

Examples of the ions important for each of the 4 organ systems.

Types of chemical bonds

Macromolecules and their subunits – no structures

Water structure and properties

The Cell

Parts of a cell – most important function of each part/ organelle

Types of transport across the plasma membrane – passive: simple diffusion, facilitated diffusion, osmosis; active transport. Give examples of where these occur within the 4 organ systems.

Cancer

Tissues

Epithelial tissue – general features and functions, simple vs. stratified, locations in body

Connective tissue – general features and functions, locations in body

Examples of these tissues in the 4 organ systems

Integumentary System

Layers of the Integument – general features and functions

Skin color

Accessory structures and functions

Skeletal System

Composition of bone matrix – types of cells and functions

Calcium – importance and homeostasis, role of hormones

Axial skeleton – main overall components and general functions of each component

Appendicular skeleton – main overall components and general functions of each component

Types of joints

Synovial joints – general features and function

Muscular System

Skeletal muscle fiber – distinctive features
Sarcomere – general structure and organization
Calcium – importance in muscle contraction
Acetylcholine – importance in muscle contraction
Relationship between neuron and muscle fiber
Whole muscle structure
Types of muscles (based on shape)
Muscle group

Nervous System

Organization of the nervous system
Neuron – general features and function
Neuroglia – general features and functions
Myelin sheath – structure and function
Resting potential
Graded potential
Action potential
Neurotransmitters – types and function
Synapses –excitation vs inhibition
Spinal cord – general features and function
Spinal meninges – general features and function

NEW MATERIAL

Brain

general features and functions - major regions, ventricles, meninges, choroid plexus, blood-brain barrier
compare cranial meninges and spinal meninges
cerebrum - lobes, cortexes, areas – structure, function
lateralization in the cerebrum
diencephalon- structures, functions
mesencephalon – structures, functions
pons, medulla and the cerebellum – structures, functions
cranial nerves – names and functions
Alzheimer's disease and other disorders

Sensation

Types of receptors – general features, functions and locations
Mechanism of sensory perception

Special Senses

Nasal cavity – anatomy, receptor cells, physiology of stimulus detection by brain

Tongue – anatomy, receptor cells, travel of stimulus to brain

Eye – anatomical structures and respective functions

Eye ball – structure and function of layers

Photoreceptor cells – organization and physiology

Myopia, hyperopia, glaucoma, cataract – know which anatomical feature of the eye is abnormal in each case

Ear – structure and function of each compartment

Travel of stimulus, perception of sound – describe in detail, with all structures involved (20 point essay question)

Autonomic nervous system

Divisions – structure, organization and function

Neurotransmitters