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2 lab practicals (each worth 100 points, total 200 points)

To calculate your final grade:

- Lecture component: Add points earned from each of the exams and final and divide by 450. Multiply this number by 0.75.
- Laboratory component: Add points earned from each of the laboratory assignments and practicals and divide by total points possible. Multiply this number by 0.25
- Finally, do the f

Topics Covered on GRE Biology Subject Test

Physiology Related Topics Covered on MCAT

SPECIALIZED EUKARYOTIC CELLS AND TISSUES

A. Nerve Cell/Neural

1. Cell body (site of nucleus and organelles)
2. Axon (structure, function)
3. Dendrites (structure, function)
4. Myelin sheath, Schwann cells, oligodendrocytes, insulation of axon
5. Nodes of Ranvier (role in propagation of nerve impulse along axon)
6. Synapse (site of impulse propagation between cells)
7. Synaptic activity
 - a. transmitter molecules
 - b. synaptic knobs
 - c. fatigue
- d. propagation between cells without resistance loss
8. Resting potential (electrochemical gradient)
9. Action potential
 - a. threshold, all-or-none
 - b. sodium–potassium pump
10. Excitatory and inhibitory nerve fibers (summation, frequency of firing)

B. Muscle Cell/Contractile

1. Abundant mitochondria in red muscle cells (ATP source)
2. Organization of contractile elements (actin and myosin filaments, cross bridges, sliding filament model)
3. Calcium regulation of contraction, sarcoplasmic reticulum
4. Sarcomeres (I and A bands, M and Z lines, H zone—general structure only)
5. Presence of troponin and tropomyosin

C. Other Specialized Cell Types

1. Epithelial cells (cell types, simple epithelium, stratified epithelium)
2. Endothelial cells
3. Connective tissue cells (major tissues and cell types, fiber types, loose versus dense, extracellular matrix)

NEUROUS AND ENDOCRINE SYSTEMS

A. Endocrine System: Hormones

1. Function of endocrine system (specific chemical control at cell, tissue, and organ levels)
2. Definitions of endocrine gland, hormone
3. Major endocrine glands (names, locations, products)
4. Major types of hormones

B. Endocrine System: Mechanisms of Hormone Action

1. Cellular mechanisms of hormone action
2. Transport of hormones (bloodstream)
3. Specificity of hormones (target tissue)
4. Integration with nervous system (feedback control)

C. Nervous System: Structure and Function

1. Major functions
 - a. high-level control and integration of body systems
 - b. response to external influences
 - c. sensory input
 - d. integrative and cognitive abilities
2. Organization of vertebrate nervous system
3. Sensor and effector neurons
4. Sympathetic and parasympathetic nervous systems (functions, antagonistic control)
5. Reflexes
 - a. feedback loop, reflex arc, effects on flexor and extensor muscles
 - b. roles of spinal cord, brain
 - c. efferent control

D. Nervous System: Sensory Reception and Processing

1. Skin, proprioceptive and somatic sensors
2. Olfaction, taste
3. Hearing
 - a. ear structure
 - b. mechanism of hearing
4. Vision
 - a. light receptors
 - b. eye structure
 - c. visual image processing

CIRCULATORY, LYMPHATIC, IMMUNE SYSTEMS

A. Circulatory System

1. Functions (circulation of oxygen, nutrients, hormones, ions, and fluids; removal of metabolic waste)
2. Role in thermoregulation
3. Four-chambered heart (structure, function)
4. Systolic and diastolic pressure
5. Pulmonary and systemic circulation
6. Arterial and venous systems (arteries, arterioles, venules, veins)
 - a. structural and functional differences
 - b. pressure and flow characteristics
7. Capillary beds
 - a. mechanisms of gas and solute exchange
 - b. mechanism of heat exchange
8. Composition of blood
 - a. plasma, chemicals, blood cells
 - b. erythrocyte production and destruction (spleen, bone marrow)

c. regulation of plasma volume

d. coagulation, clotting mechanisms, role of liver in production of clotting factors

9. Oxygen and carbon dioxide transport by blood

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