

Comprehensive Replacement Exam  
Chapter Hot List Questions

C1 Introduction to Anatomy and Physiology

1. What is the definition of anatomy?
2. What is the definition of physiology?
3. What is homeostasis? Significance?
4. What is negative feedback? Example? Significance?
5. What is positive feedback? Example? Significance?
6. What is the difference between a hypothesis and a theory?
7. Why is it important to understand the structural organization of the human body?
8. What is the simple model for the exchanges between the external and internal environments?

C2 Chemical Level

1. What is an atom?
2. What is a molecule?
3. What are the two type of chemical bonds used to make molecules?
4. What is the difference between a covalent bond and a polar covalent bond? Give examples.
5. What is an acid?
6. What is a base?
7. What is a salt?
8. What are the four organic compounds? Primary function of each compound type?
9. What is an enzyme?

C3 Cellular Level of Organization

1. What is a cell?
2. What is a phospholipid bilayer called?
3. What is an organelle?
4. What functions are associated with these organelles? (nucleus, ribosomes, golgi apparatus, lysosomes, centrioles, proteosomes, mitochondria)
5. What is the difference between filtration, diffusion, and osmosis?
6. What is tonicity?
7. What are transmembrane proteins?
8. What is the difference between endocytosis and exocytosis?
9. What are the major steps in protein synthesis? (Explain using these terms - gene, mRNA, tRNA, rRNA, cytoplasmic ribosomes VS rough endoplasmic ribosomes)
10. What is the difference between mitosis and meiosis?

C4 Tissue Level of Organization

1. What is tissue?
2. What are the four tissue types?
3. What are the major characteristics of each tissue type?
4. What is a gap junction?
4. What tissues are excitable?
5. What are glands?

6. What is the difference between an endocrine and exocrine gland?
7. What is the difference between mucous and serous membranes? Locations?
8. What is the difference between tissue regeneration and fibrosis?

#### C5 The Integumentary System

1. What are the two layers of skin? What are the characteristics of each layer?
2. What tissue layer is deep to the cutaneous membrane?
3. How long does it take to replace your skin?
4. What is the function of these cells? (keratinocyte, melanocyte, dendritic cell or intraepidermal macrophage, Merkel cell)
5. What is a sebaceous gland?
6. What are the two type of sudoriferous glands? Location and functions?
7. What is a ceruminous gland?

#### C6 Bone Tissue

1. What is an osteon?
2. What is interstitial growth? When does it occur?
3. What is appositional growth? When does it occur?
4. What is the difference between the epiphyseal plate and the epiphyseal line?
5. What are the four steps in repair of a bone fracture?

#### C9 Joint Classifications

1. Using the structural classification of joints, what are the three types?
2. Using the functional classification of joints, what are the three types?
3. What is the criteria used to distinguish structural VS functional classification of joints?
4. What is a bursa?
5. What are ligaments?

#### C10 Muscular Tissue

1. What are the three muscle types?
2. What are the characteristics of each muscle type?
3. How is connective tissue integrated into skeletal muscle? (Explain using the following terms: epimysium, perimysium, endomysium, fascia)
4. What is a tendon?
5. What is a sarcomere?
6. What is the structure of skeletal fiber? (Explain using the following terms: sarcolemma, myofibril, thick filament or myosin, thin filament or actin, sarcoplasmic reticulum, T-tubules)
7. What occurs at the neuromuscular junction?
8. What is the power stroke?
9. What is the significance of the length tension relationship?
10. What is the significance of the motor unit?
11. What is the difference between isotonic and isometric muscle contractions?
12. What is the difference between visceral (single-unit) smooth muscle and multi-unit smooth muscle? Which smooth muscle type have many gap junctions?

## C12 Nervous Tissue

1. How is nervous tissue organized? (sketch a diagram showing central nervous tissue and peripheral nervous tissue subdivided into somatic, autonomic nervous tissue, and enteric nervous tissue)
2. What is the name of the functional cell in nervous tissue?
3. What is the name for other cells in nervous tissue that provide support and function for the primary cells?
4. What is the difference between Schwann cells and oligodendrocytes?
5. What is myelin?
6. What is a local potential? Characteristics? Locations?
7. What is an action potential? Characteristics? Location? (Define these terms: resting membrane potential, local potential, threshold, depolarize, repolarize)
8. What is voltage?
9. What is current?
10. What is a synapse? Three parts?
11. What is a neurotransmitter?

## C13 Spinal Cord and Spinal Nerves

1. What is the gross anatomy of the spinal cord? (Fig 11.1)
2. What are spinal nerves? Location? Characterized as what type of nerve?
3. What are functional terms used to describe nerves?
4. What are structural terms used to describe nerves?
5. What are interneurons? Location?
6. What is the difference between ganglia and nuclei?
7. What is a reflex? Characteristics?

## C14 Brain and Cranial Nerves

1. What part of the brain is our conscious brain?
2. What is the gateway into the cerebrum?
3. What type of functions are associated with the medulla oblongata?
4. What type of functions are associated with the hypothalamus?
5. What type of functions are associated with the limbic system?
6. What gyrus is responsible for skeletal muscle contractions?
7. What gyrus is responsible for somatosensory?
8. What is the function of the cerebellum?
9. What part of the brain is responsible for “executive functions”? (making conscious decisions)
10. What is the significance of the reticular formation?
11. What are cranial nerves?
12. Why is the hypothalamus called a “boss”? Of what?

## C15 Autonomic Nervous System

1. What are the two divisions of the ANS? (Origins and functions?)
2. What type of functions are regulated by the ANS?
3. What division of the ANS is more divergent?
4. What is autonomic tone?
5. What is the boss of the ANS?

## C16 Sensory, Motor, and Integrative Systems

1. What do we mean by transduction of a stimulus? (What is the stimulus converted into?)
2. What is a somatic sensation?
3. What is a proprioceptive sensation?
4. What is motor control? How does it work? (fig 16.13) Note: think about intent VS performance.

## C17 Special Senses

1. What is emmetropic vision?
2. What is myopic (nearsighted) vision?
3. What is hyperopic (farsighted) vision?
4. Where is electromagnetic stimulus processed?
5. What is the function of cones and rods?
6. What type of stimulus is carried by the vestibulocochlear nerve?
7. What is the startle reflex? Explain different pathways.
8. What is the difference between static, dynamic, and rotational equilibrium?

## C18 Endocrine System

1. What are hormones?
2. How do hormones work?
3. What is the significance of up and down regulation? What happens to make this possible?
4. What is the boss of the endocrine system?
5. What structure is called the master endocrine gland? Why?
6. What are the functions of the following hormones: insulin, glucagon, adrenocorticotropic hormone, antidiuretic hormone, aldosterone, prolactin, oxytocin, cortisol, growth hormone, thyroid hormone, thyroid stimulating hormone.
7. What is negative feedback regulation of hormones? Example
8. What is positive feedback regulation of hormones? Example

## C19 Blood

1. What are formed elements? Where are they formed?
2. What are the functions of blood?
3. What is the difference between plasma and serum?
4. What is the significance of the blood proteins?
5. How long does it take to make a new RBC?
6. How long do RBCs circulate in the blood?
7. What are the functions of the spleen?
8. What are neutrophils' four most important functions?
9. What is the structure and function of the ABO System?
10. What is hemostasis?

## C20 The Heart

1. Why is the heart described as a high and low pressure pump?
2. What is the structure and function of the four heart valves?
3. What are the three blood circuits?

4. What is the structure and function of the intrinsic conduction system of the heart?
5. What allows the heart to regulate the cardiac cycle?
6. How does the cardiovascular center modify the heart rate?
7. What is the significance of these terms: cardiac output, cardiac cycle, heart rate, stroke volume, end diastolic volume, preload, end systolic volume, afterload, isovolumic volume(s), systolic pressure, diastolic pressure.
8. What is congestive heart failure?
9. What is the significance of the EKG?

#### C21 Blood Vessels

1. What are arteries? Characteristics?
2. What are veins? Characteristics?
3. What are capillaries? Characteristics?
4. What is the significance of metarterioles and thoroughfare channels?
5. What are precapillary sphincter muscles? How regulated?
6. What is the significance of arterioles? How regulated?
7. What forces regulate the hemodynamic flow across a capillary bed?
8. Where is the vasomotor center located? Function(s)?
9. What are the three types of capillaries? Location of each?
10. What are endothelial cells?

#### C22 Lymphatic System and Immunity

1. What is the structure and function of the lymphatic system?
2. What is unique about a lymphatic capillary?
3. What are the functions of the lymphatic nodes?
4. What are the innate defenses? Their characteristics?
5. What are the non-innate defenses characteristics?
6. What is the significance of born-educated-deploy? Where and what happens at each step?
7. What is the significance of the three R (recognize-react-remember)? Where and what happens at each step?
8. What is inflammation? Initiated by? First to arrive? Significance of respiratory burst?
9. What WBC increase after bacterial infection?
10. What WBC increases after a parasitic infection?
11. What are the antigen presenting cells? Their functions?
12. How are cytotoxic T cells and natural killer cells similar?
13. Why are helper T cells so important to our immune system?

#### C23 Respiratory System

1. What type of gas exchange occurs in the pulmonary and systemic circulations?
2. What airways occur in the conducting zone and respiratory zone? (fig 23.8)
3. What is the structure and function of the respiratory membrane?
4. What three cell types make up the wall of the alveolus?
5. What is responsible for inhalation?
6. What is responsible for exhalation?
7. Where is pressure increased or decreased so air ventilates the lung?
8. What is tidal volume? How much air is moved during quiet breathing?
9. Where is the respiratory control center located?
10. What two reflexes in the lung tissue may modify the central respiratory control center?

11. How much oxygen may be carried by a single hemoglobin molecule?
12. Under a resting state, what causes oxygen to unload from hemoglobin in the systemic circuit?
13. When exercising, what factors will cause more oxygen to be unloaded?