

Human Anatomy & Physiology Spring Final Exam Review

Chapter 11:

1. Outline the major divisions of the nervous system.
2. Discuss how the organs of the central nervous system (CNS) are protected in terms of bones, membranes and fluid.
3. Name the three meninges and discuss the differences between how they are structured around the brain and spinal cord.
4. Name the space that lies between two of the meninges surrounding both the brain and spinal cord, and name the fluid that fills this space.
5. Name the additional space that is found around the spinal cord, and name the fluid that fills this space.
6. Define the term *meningitis*.
7. Fully discuss the cross-sectional anatomy of the spinal cord.
8. Name the cells that line the central canal and identify the fluid that fills the central canal.
9. Compare and contrast ascending and descending tracts.
10. Define the term *ganglion* and discuss the specificities of a dorsal root ganglion.
11. List and discuss the components in a reflex arc.
12. Name and locate the three major regions of the brain.
13. Discuss the structure of the cerebrum in terms of its size, two major divisions, surface appearance, major grooves, and lobal divisions.
14. Define the term *cerebral cortex* and discuss its composition and significance.
15. Explain what is meant by hemisphere dominance, and name the hemisphere that is dominant in most people.
16. Define the term basal ganglia and explain their location and function.
17. Name the interconnected cavities within the cerebrum and brain stem and identify the fluid that fills these spaces and name the cells that line these spaces.
18. Name the specialized capillaries that secrete CSF and denote their location on a diagram.
19. Discuss the functions of CSF.
20. Discuss the two important areas of gray matter within the diencephalon, in terms of location and function.
21. Identify the three major parts of the brain stem.
22. Discuss the midbrain in terms of its location, composition and function.
23. Discuss the importance of the medulla (oblongata).
24. Briefly explain the significance of the limbic system and reticular formation.
25. Locate the cerebellum on a diagram, and discuss its structure and function.
26. Discuss the general structure of a nerve.
27. Distinguish between a mixed, sensory, and motor nerve.
28. Name the twelve pairs of cranial nerves, designate them by Roman numeral, discuss their function, and designate them as sensory, motor, or mixed.
29. Discuss the characteristics of spinal nerves in terms of number, coverings, and composition.
30. Compare the somatic and autonomic divisions of the NS in terms of motor neurons involved, the presence or absence of ganglia, neurotransmitter type, and effector type.
31. Describe the general function of the ANS.
32. Name the two major divisions of the ANS, and describe their general function.
33. Compare the length of a preganglionic and postganglionic neuron in the sympathetic and parasympathetic division of the ANS.
34. Define the term *ganglion*, and compare the location of sympathetic and parasympathetic ganglia.
35. Explain why sympathetic ganglia are called chain ganglia.
36. Distinguish between cholinergic and adrenergic fibers (axons).
37. Define the term *receptor*.

Chapter 12:

1. Define the terms *sensation* and *perception* and differentiate between the two.
2. Define the term *sensory receptor* and classify them according to stimulus type.
3. Explain what is meant by the term *sensory adaptation*, and name the only type of sensory receptor that does not undergo sensory adaptation.
4. Discuss the three types of receptors responsible for the senses of touch and pressure.
5. Distinguish between the two types of thermoreceptors.
6. Name the ultimate function of pain receptors.
7. Explain the phenomenon of *referred pain*.
8. Compare and contrast acute and chronic pain.
9. Name the five special senses.

10. Define the term *olfaction*, name the type of sensory receptors involved in olfaction, name the location of those receptors, and identify the responsive portion of those receptors.
11. Define *gustation*, name the type of sensory receptors involved in gustation, name the location of those receptors, and identify the responsive portion of those receptors.
12. Sketch a tongue and locate the four different types of taste buds.
13. Name the three parts of the ear, list the specific components within each, and give a general function for the structures.
14. Name the opening between the middle and inner ear (i.e. the entrance to the inner ear).
15. Name the tube that connects the middle ear to the nasopharynx and explain its significance.
16. In the cochlea, give the specific names for the bony and membranous labyrinths, name the fluid that fills each, and name the membranes that separate the three chambers.
17. Describe the structure, location and function of the Organ of Corti.
18. Trace the pathway of sound from where sound waves reach the auricle to where to its interpretation site in the brain.
19. Discuss the accessory organs of the eye in terms of their names, location, and functions.
20. Name the three tunics of the eye, give a general function for each, and name the specific components of each tunic.
21. Describe the structure and function of the cornea & sclera.
22. Name the fibers that connect the components of the ciliary body, and describe what happens to them when focusing on a close versus a distant object (i.e. describe accommodation).
23. Explain how the eye is divided into cavities and chambers, and name the fluid that fills each.
24. Compare and contrast the two types of photoreceptors present in the retina of the eye.
25. Explain why we possess a blind spot.
26. Trace a photon of light from where it penetrates the cornea of the eye to where it's interpreted in the brain.

Chapter 14:

1. Describe blood according to its tissue type and major functions.
2. Define the term *hematology*.
3. Name the average volume of blood in a human.
4. Name the two major components of blood and the percentage of each by weight.
5. Give the common and scientific name for the three types of blood cells, and describe each in terms of their circulating concentration in a normal individual, overall function, and key characteristics.
6. Explain why a mature erythrocyte lacks a nucleus.
7. Explain why red blood cells have a relatively short life span.
8. Discuss where erythropoiesis occurs in adults and fetuses, and what other factors are needed for red cell production.
9. Outline the negative feedback loop involving the hormone erythropoietin.
10. Distinguish between granulocytes and agranulocytes, name the leukocytes in each category, and list the specific function for each cell type.
11. Name the process by which a leukocyte leaves the blood stream and enters a tissue (Is this normal?).
12. Name the primitive bone marrow cell from which all blood cells arise.
13. List the components transported in blood plasma.
14. Outline and explain the three steps involved in hemostasis.
15. Name the hormone that platelets within a platelet plug release that causes further vasoconstriction of a vessel.
16. Describe the final step in blood coagulation.
17. Name the natural anticoagulant released by basophils and mast cells.
18. Define the term *agglutination*.
19. Discuss blood typing (A, B, AB, O) and transfusions in terms of the following:
 - a. the antigen present on a person's (recipient's) erythrocytes
 - b. the antibodies within the person's (recipient's) plasma
 - c. compatible donor types
 - d. incompatible donor types.
20. Identify the blood type considered the universal donor and the blood type considered the universal recipient.
21. Discuss what is meant by Rh incompatibility and its consequences.

1. Chapter 15:

2. Distinguish between the pulmonary and systemic circuits (circulatory routes).
3. List the organs that compose the cardiovascular system and discuss the general functions of this system.

4. Describe the location, size, and orientation of the human heart.
5. Describe the structure of the heart in terms of its coverings, wall layers, chambers, valves, and blood vessels.
6. Name the function of serous fluid around the heart.
7. Give another name for epicardium.
8. Describe the structure and function of the interventricular septum.
9. Explain why the atria are passive chambers, while the ventricles are active.
10. Name the function of heart valves.
11. Distinguish between AV and SL valves in terms of location, structure, and when they close.
12. Define/describe the terms *chordae tendineae*, *papillary muscle*.
13. Name (and locate) the veins that deposit their blood into the atria of the heart (which atria? deox- or oxygenated?).
14. Name (and locate) the arteries that take blood away from the heart (from which ventricle? deox-or oxygenated blood?).
15. Distinguish between pulmonary, coronary and systemic circulation.
16. Track a drop of blood through the following circulations:
 - a. pulmonary (heart to lungs and back to heart)
 - b. coronary (through myocardium)
 - c. systemic (heart to body and back to the heart, in general).
17. Name the term referring to all of the events associated with one heartbeat.
18. Define the terms *systole* and *diastole*.
19. Name the two major divisions of the cardiac cycle, and compare them in terms of direction of blood flow, whether valves are opening or closing, and relative pressure within the chambers.
20. Discuss heart sounds in terms of what they represent, how they sound, how they are detected and their significance.
21. Explain the significance of each component of the cardiac conduction system and trace how the cardiac impulse travels through the myocardium.
22. Name the common term for the sinoatrial (SA) node.
23. Trace a typical ECG and label each wave or complex and explain what event of the CCS corresponds to each wave.
24. Outline the phases of the cardiac cycle in terms of what is happening in the ECG trace, mechanical events (contraction or relaxation), atrial pressure, ventricular pressure, ventricular volume, aortic pressure and timing.
25. Define the terms *cardiac output (CO)*, *heart rate (HR)*, and *stroke volume (SV)*.
26. Discuss the factors that regulate heart rate.
27. Explain what is meant by the human cardiovascular system being a "closed system".
28. Compare and contrast the 3 types of blood vessels in terms of the following:
 - a. direction of blood-flow (in terms of the heart),
 - b. wall structure (# of layers and components of those layers),
 - c. gas concentrations and
 - d. pressure.
29. Describe how arterioles play a major role in regulating blood flow to capillaries.
30. Discuss the major event that occurs at capillaries.
31. Discuss the factors that affect cardiac output.
32. Define the term *blood pressure*, name the type of blood vessels where blood pressure is significant, and name the normal (average) value in a resting adult.
33. Define the term *blood resistance* and discuss the three major factors that determine it.
34. Explain the processes by which materials are exchanged through a capillary.
35. Define the terms *tachycardia* and *bradycardia*.
36. Name the branches of the ascending aorta, aortic arch, thoracic aorta, and abdominal aorta, and denote what body region they supply with blood.
37. Explain what happens to the aorta at the brim of the pelvis.
38. Although the venous circuit is essentially parallel to the arterial circuit, list the differences between the two.
39. Name the longest vein in the body and the venipuncture site.
40. Discuss hypertension.

Chapter 17:

1. Define the term *digestion* and explain its significance.
2. Distinguish between mechanical digestion and chemical digestion.
3. Discuss the five digestive processes that overview the many functions of the digestive system.
4. Distinguish between the alimentary canal and digestive accessory organs.
5. List the organs that compose the alimentary canal and identify each on a diagram.
6. List the digestive accessory organs and identify each on a diagram.

7. Name the four layers that compose the wall of the alimentary canal from innermost (lining lumen) to outermost.
8. Compare and contrast the four layers of the alimentary canal wall (named above) in terms of their structure, function, and any distinguishing features.
9. Name the layer of the alimentary canal that is synonymous with visceral peritoneum.
10. Explain the significance of mesenteries or peritoneal extensions.
11. Describe how food is moved through the length of the alimentary canal and name the layer responsible for these actions.
12. Define the term *digestive sphincter muscle*, describe the structure of these muscles, name the function of these muscles, and denote the major five locations of digestive sphincter muscles.
13. Describe the overall structure and function of the mouth.
14. Discuss the three portions of the palate, in terms of location and give an overall function for the palate.
15. Name the tissue that composes the tonsils and name the overall function of tonsils.
16. Name the two sets of teeth we possess as humans, discuss the general structure of a tooth, and describe the four types of teeth we possess according to their location and function.
17. Name and locate the three sets of salivary glands in humans, name and describe the secretions from these glands, and name the two types of cells that compose these glands.
18. Discuss the enzyme "salivary amylase", in terms of its digestive function, location, and secretory gland.
19. Name the function of the epiglottis.
20. Define the term *peristalsis* and explain its digestive function.
21. Define the term *gastric*.
22. Describe the macroscopic structure of the stomach and locate it on a diagram or torso model.
23. Name the term used to describe the mucosal folds of the stomach lining and explain their significance.
24. Name the four types of cells that compose gastric glands, name the secretion(s) that each cell produce(s) that together compose gastric juice, and give the function of each component of gastric juice.
25. Define the term *chyme*.
26. Name one substance that is absorbed through the gastric mucosa.
27. Name the hormone that regulates the release of gastric juice, explain when it is released, and the results of its action.
28. Using anatomical terminology, describe the location of the pancreas in the abdominal cavity.
29. Explain how the pancreas aids in digestion by listing the components in pancreatic juice, and naming the action of each of those components.
30. Name the site of pancreatic enzyme action.
31. Name the regulatory hormone responsible for the release of pancreatic juice into the duodenum, and explain when it is activated.
32. Using anatomical terminology, describe the location of the liver in the abdominal cavity.
34. Describe the many functions of the liver.
35. Define the term *emulsification* and explain its role in digestion.
36. Using anatomical terminology, describe the location of the gallbladder in the abdominal cavity.
37. Name the function of the gallbladder.
38. Name the "common" route that bile travels from either the liver or gallbladder and name the site where bile is deposited.
39. Name the regulatory hormone that is responsible for the release of bile into the duodenum and explain when it is activated.
40. Name the three parts of the small intestine, and locate each on a diagram or torso model.
41. Discuss the histology of the small intestinal wall.
42. Name the digestive enzymes that are secreted by the mucosa of the small intestines and explain the action of each.
43. Distinguish between the duodenum and the distal small intestine (i.e. jejunum and ileum) in terms of function.
44. Name the four parts of the large intestine and locate each on a diagram or torso model.
45. Name the four parts of the colon and locate each on a diagram or torso model.
46. Identify the major digestive function of the large intestine.
47. Explain how the movements in the large intestine differ from those throughout the rest of the alimentary canal.
48. Define the terms *feces* and *defecation*.
49. Name the sphincter muscles that open to the outside and explain how their action is controlled.

Chapter 20:

1. Name the organs of the urinary system and list their general functions.
2. Describe the locations of the kidneys and the structure of the kidney.
3. List the functions of the kidneys
4. Trace the pathway of blood through the major vessels within a kidney
5. Describe a nephron and explain the functions of its major parts.
6. Explain how glomerular filtrate is produced and describe its composition.
7. Explain how various factors affect the rate of glomerular filtration and how this rate is regulated.
8. Discuss the role of tubular reabsorption in urine formation.
9. Explain why the osmotic concentration of the glomerular filtrate changes as it passes through a renal tubule.
10. Define tubular secretion and explain its role in urine formation.
11. Describe the hormonal controls involved in urine production.
12. Describe the structure of the ureters, urinary bladder and urethra.
13. Discuss the process of micturition and explain how it is controlled.
14. Describe how the components of the urinary system change with age.