Anatomy and Physiology
Second Semester Exam Review

Nervous System:
1. Parts of the central nervous system? Brain and spinal cord
2. Define/describe synapse, dendrite, axon, nodes, myelin sheath, Schwann cell
   - Synapse – gap between neurons
   - Dendrite – tendrils of neurons that pass on nerve impulses
   - Axon – long tendril that receives nerve impulse
   - Node – portion of axon not covered by myelin sheath
   - Myelin sheath – insulator of axon, speeds nerve impulse
   - Schwann’s cell – cell wraps around axon to form myelin sheath
3. Discuss integration, motor output, and sensory input
   - Sensory input – sensory receptors receive stimuli and send nerve impulse to CNS
   - Integration – brain receives sensory input and decides proper response
   - Motor output – brain sends nerve impulse down motor nerves to muscles or glands to respond
4. What are neurotransmitters? Chemicals that ferry nerve impulse across synapse
5. Information is carried from the central nervous system to a muscle or gland by? Motor nerve
6. What are characteristics of the peripheral nervous system? Nerve fibers that extend from brain and spinal cord into body and extremities
7. What does the autonomic nervous system control? Involuntary processes
8. Sensory neurons transmit messages from receptors to CNS
9. Which motor subdivision regulates smooth and cardiac muscle? Somatic
10. Which type of sensory fiber conveys impulses from visceral organs to the CNS? Visceral afferent
11. What are the four main parts of the brain? Cerebrum, Cerebellum, Medulla/pons, brain stem
12. The “inner room” which acts as the relay station for sensory cortex? Thalamus
13. Which part of the brain influences emotions, pleasure, and sex drive? Hypothalamus
14. Which part of the brain stem is the most inferior and merges into the spinal cord? Medulla oblongata
15. The area of the brainstem which contains mostly white matter and means “bridge”? Pons

Diagrams: both brain diagrams

The Special Senses-SIGHT
1. Which structure of the eye surrounds the pupil? Iris
2. What is the blind spot? Place on the retina that has no photoreceptors; optic disc
3. Which structure of the eye brings light rays to focus on the light sensitive retina? Lens
4. Which structure of the eye is a transparent jellylike substance within the eyeball and gives the eyeball shape? Vitreous humor
5. Which structure of the eye controls the diameter of the pupil? Iris
6. Which structure of the eye is a transparent jellylike substance between the cornea and the iris? Aqueous humor
7. Which structure of the eye is known as the “white of the eye”? Sclera
8. Which structure of the eye is the colored portion of the eye? Iris
9. Starting from the outer layer to the inner layer, list the correct sequence of the wall of the eye. Sclera, choroid, retina
10. Starting with the cornea, list the structures light would pass through as it passes through the eye. Aqueous humor, lens, vitreous humor, retina
11. What is the function of the fovea centralis? Point of greatest visual acuity
12. Myopia: eyeball too long or too short
   - Image focused behind or in front of retina
   - Decrease in ability to see far or near
correction with concave or convex lens  
nearsighted or farsighted

13. Hyperopia: eyeball too long or too short  
image focused behind or infront of retina  
decrease in ability to see far or near  
correction with concave or convex lens  
nearsighted or farsighted

14. What is accommodation? Adjustment of focal point
15. Which muscle moves the eye laterally, and medially? Lateral rectus and medial rectus
16. List the difference between rods and cones. (you may construct a chart) – Rods: black and white only, most numerous; cones: see color, have greater acuity

Diagrams: Parts of the EYE, Muscles of the EYE

The Special Senses-TASTE/SMELL
1. Which is more acute, smell or taste? smell
2. Division of these cells replace taste cells as they are shed? Basal cells
3. Projections of the tongue mucosa where taste buds are found? papillae
4. These papillae are scattered over the entire surface of the tongue but are most abundant at its tip and along its side? fungiform
5. These cells form the bulk of the taste bud and surround gustatory cells? Supporting cells
6. 7 to 12 of these papillae form a V at the back of the tongue? circumvallate
7. % of nasal cavity related to smell? 5%
8. Which cells constitute about 7-14% of the taste bud? Gustatory cells
9. Where are olfactory hairs located, and what are their functions? Increase surface area, cilia in the nose that contain mucus to collect chemical smells

Diagrams: Regions of Taste sensitivity on the tongue, Location and structure of taste buds, olfactory receptors

Respiratory System:
1. What are the smallest respiratory passageways? bronchioles
2. The correct sequence for the path of oxygen through the respiratory system? Nose, pharynx, trachea, bronchi, bronchioles, lungs, alveoli, capillaries
3. What is the function of the cartilage around the trachea? Keep windpipe stiff and open
4. What is the function of the cilia that lines the trachea and bronchi? Trap particles, move them up and out of resp. system
5. What is the function of mucus secreted by the nasal mucosa? Trap pathogens
6. Which structure closes the nasopharynx during swallowing? epiglottis
7. Where is the actual site of gas exchange? Capillaries of the alveoli in lungs
8. What is smoker’s cough? hacking cough of smokers due to their lungs stiffness and inability to fully expand and exchange gases
9. Should air sacs be rigid? No, flexible and exapandable
10. Are alveoli thick or thin? What are they filled with? Thin, and covered in capillaries

Cardiovascular System with blood:
1. List the formed elements. WBC, RBC, platelets
2. List the function of each of the formed elements. WBC – fight pathogens; RBC – carry oxygen to cells; Platelets - clotting
3. Which component of whole blood is the most abundant? plasma
4. Which formed element is the most abundant? RBCs
5. The major component of plasma? H₂O
6. Which cells are biconcave in shape? RBCs
7. Which cells are fragments of large cells? plats
8. Which cells lack a nucleus? RBCs
9. Oxygen transporting component of erythrocytes? Hemoglobin
10. What are the three common causes of anemia? Insufficient RBCs, abnormal hemoglobin, low iron
11. Each blood type (O, A, B, AB) blood contains which antigens and which antibodies? (see chart on ws)
12. Which blood type is considered the universal donor? O
13. Which blood type is considered the universal recipient? AB
14. For all of the following arteries, describe which parts of the body they supply with blood: aorta, axillary, brachial, gastric, hepatic, radial, renal, splenic (see ws)
15. Which artery is the largest? aorta
16. Which vein is used in bypass surgery? Great saphenous vein
17. Jugulars drain blood from? Head and neck
18. What is the difference between the vena cava? Superior – drains from head, neck, shoulders; Inferior – drains all of lower body
19. Where in the body is the femoral located? thigh
20. Which vein is known as the vein of the armpit? axillary
21. What is the function of the fluid in the pericardial sac? Protect heart
22. What is an ECG? Electrical recording of the contraction of the heart muscle
23. Discuss what is occurring at each wave?
   P – atria contract
   Q – impulse passes through
   R – ventricles contract
   S – negative charge
   T – ventricles rest
24. Discuss each chamber of the heart, type of blood, collection or pumping
   Rt atrium – collects deoxygenated blood
   Rt ventricle – pumps deoxygenated blood to lungs
   Left atrium – collect oxygenated blood from lungs
   Left ventricle – pumps oxygenated blood to body
25. What is the function of the tricuspid and bicuspid valves? Prevent backflow into atria
26. What is the pacemaker and where is it located? Sino atrial node is the starting point of electrical impulse that guides contraction; in the rt atrium
27. Discuss the pulmonary arteries and pulmonary veins. (carry blood to/from; type of blood; difference from other arteries/veins) pulmonary arteries take deoxygenated blood from heart to lungs; pulmonary veins return oxygenated blood from lungs to heart
28. The contraction of the ventricle is referred to as R and the period of ventricular relaxation is called T

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**Endocrine**
1. The endocrine is known as the second messenger of the body.
2. What kind of messenger does the endocrine system use? chemical
3. What mechanism maintains proper hormone levels in the blood? Negative feedback
4. Which gland is responsible for the development and function of the immune system? thymus
5. What are risk factors for Type 2 diabetes? Being overweight, being older, family history of diabetes, previous gestational diabetes

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**Immune/Lymph System:**
1. Define antibodies. Specialized parts of the immune system that inactivate specific pathogens; part of humoral immunity
2. What would happen after a macrophage engulfs a pathogen? The macrophage would display the pathogen’s antigens (markers) on its surface.
3. The skin is considered to be what line of defense? 1st
4. High white blood count and swollen lymph nodes are indicators of what? Infection.
5. What is the main function of lymph nodes? To filter lymph fluid and mature B cells.
6. What things happen when the inflammatory response is triggered? Pain, swelling, heat, redness.
7. What is the function of each of the following white blood cells: killer T cells (recognize pathogen markers on infected cells and destroy those cells), helper T cells (recognize pathogen markers on macrophages and sound the alarm), B cells (produce specific antibodies), suppressor T cells return immune system to balance?
8. When do Killer T cells recognize cells that have been infected by viruses? When those cells display the pathogen’s antigen markers.
10. What is an abnormal accumulation of fluid in tissue spaces? Edema.
11. What is the major lymph vessel in the body? Thoracic duct.
12. How do T cells get their name? They mature in the thymus.
13. All the cells of the immune system arise from where? Bone marrow.
14. The cells that set the immune system into motion are phagocytic cells known as? Macrophages.
15. Lymphokines are secreted by which cells? Helper T’s.
17. What’s considered the first line of defense? Skin, mucus membranes. What’s considered the second line of defense? Inflammation, fever.

**Urinary System:**
1. The kidneys play a major role in? Removal of nitrogenous waste from blood.
2. Filtrate moves into the Bowman’s capsule from the? Renal tubule.
3. Compare urine with the initial filtrate. Filtrate is essentially blood plasma without blood proteins (proteins and RBCs too large to pass through). Urine contains water, creatinine, ions, nitrogenous waste.
4. What is the correct pathway for blood entering the nephron system? Interlobular artery → arcuate artery → intertubular artery → afferent arteriole → glomerulus → Bowman’s capsule.
5. Urine produced in the kidneys passes into the bladder through tubes called? Ureters.
6. Through which of the following tubes does urine leave the body? Urethra.

**Diagrams:** Kidney, urinary system, nephron.

**Reproductive System:**

*Male*
1. Discuss the role of the testes. Produce sperm.
2. What is a vasectomy? Severing of ductus deferens to confer sterility.
3. List and discuss the parts of a sperm. Tail (for motion), midpiece (mitochondrion for ATP production), head (acrosome for enzyme penetration, nucleus to hold DNA).
4. What is the prepuce? Foreskin.
5. What is the male secondary sex characteristic? More body and facial hair, heavier muscles and bones, lowered voice.
6. Development of secondary sex characteristics in a male is stimulated by? Testosterone.
7. The majority of the semen is produced by the? Seminal vesicles.
8. Sperm mature and are stored in the? Epididymis.
9. During the excitement phase of intercourse, what makes the penis enlarge and become rigid? Blood flow.

**Diagrams:** Male reproductive system.
**Female**

1. Where are eggs produced? **Ovaries**
2. What is the function of the Fallopian tubes? **Egg is fertilized here; connection between ovary and uterus**
3. What is the muscular structure in which the fetus develops? **uterus**
4. What are the roles of the hormone estrogen, progesterone, FSH, and LH in the female cycle? - IGNORE
5. The ruptured follicle left in the ovary after ovulation develops into? IGNORE
6. If no embryo arrives after the uterus has prepared to receive it, what happens? **menstruation**
7. Female accessory sex organs? **Breasts, widening of pelvis**
8. Function of the following structures in the female breast: alveolar glands (produce milk), lactiferous ducts (open to nipple for suckling), lactiferous sinus (store milk)
9. What is menstruation? **Shedding of endometrium layer of uterus if no fertilized egg is present**
10. Which female structure erects during sexual stimulation? **clitoris**
11. What is PID? **Pelvic inflammatory disease – chronic infection of the pelvic cavity; primarily in women**

**Diagrams:** female reproductive system