

STUDY GUIDE

Nervous System

- 1. A.** Which parts of the nervous system are responsible for the following functions of the nervous system: sensory input, integration and motor output. **B.** What are some other overall functions of the nervous system in relation to how the body functions.
- 2. A.** What are the two major divisions (and their abbreviations) of the nervous system? **B.** What are these two divisions made up of physically (parts)? **C.** What are the functions of these two divisions?
- 3. A.** The PNS consists of two divisions: the Somatic and Autonomic. What are the overall functions of these two divisions? Give some examples of systems controlled by each. **B.** The autonomic portion of the PNS is also divided into two different functions: the sympathetic and parasympathetic. What are the overall functions of these two divisions? Give some examples of systems/structures controlled by each.
- 4. A.** Diagram the Subdivisions of the Nervous system showing how they "relate" to one another. This should look like an organizational chart. Use the following words (at least): CNS, PNS, Somatic, Autonomic, Parasympathetic, Sympathetic. Feel free to fill in more detail to help you understand/study this organization.
- 5. A.** Draw and label a simplified example of a nerve cell (neuron) consisting of the four main parts of the neuron. **B.** For each of the four parts, explain the function(s) of each. **C.** What is the myelin sheath of a neuron, where does it come from and what does it do for the neuron or nervous function?
- 7.A.** What is meant by a "resting potential", When does this occur and describe both sides of the plasma membrane during this time. **B.** What do sodium-potassium pumps do and how do they accomplish this? **C.** Why is the inside of the cell naturally negative (i.e. what kinds of negatively charged molecules are always inside cells?)
- 9. A.** What is meant by an "action potential"? **B.** Describe what happens on either side of the membrane. **C.** How does an action potential move along the neuron?. **E.** An action potential is said to be an "all or nothing" event - what is meant by this? **F.** How can your brain sense the difference between a loud sound and a soft sound if action potentials are "all or nothing" events?
- 10.A.** What is a synapse? **B.** How can a nerve signal continue when it encounters a synapse? **C.** What are neurotransmitters and how do they work?
- 11. A.** Name and describe some of the structures that protect your CNS. **B.** What are some of the major functions of the spinal cord?

13. A. Describe the structures and pathways involved in transmitting the impulses of each of the five special senses to the brain. **B.** What are the two main types of protein channel gates that initiate signals at the sensory receptors. Which senses have each type?

Lymphatic & Immune Systems

- 1. A.** What are the three major functions of the lymphatic system? **B.** What other systems does the lymphatic system interact with directly? How?
- 2. A.** Describe the functions of each of the following structures: Lymph vessels, lymph nodes, lacteals, spleen, bone marrow, thymus gland.
- 3. A.** What is the relationship between the lymphatic system and cancer? **B.** What are the pathologies involved with lymphatic filariasis? What causes lymphatic filariasis?
- 4. A.** What are four kinds of non-specific defenses we have against invaders? Describe how each functions to defend the body. **B.** Describe the functions of each of the following components of the non-specific defenses: lysozyme, bile, cilia, sebum, inflammation, histamine, macrophages, complement, RBC's, eosiniphils, fever
- 5. A.** Describe the functions of each of the following components of the specific defenses: antigens, antibodies, B-lymphocytes, T-lymphocytes, porforin
- 6. A.** Describe the following STD's: chlamydia, gonhorrea, syphilis, *trychamonas*, lice, HPV, HSV, HIV, HBV. **B.** For each, answer the following questions: How is it transmitted?, What are the symptoms?, What is the causative agent?, Can it be cured?

STUDY GUIDE
Chapter 16 & 20
Reproduction and Development

1. **A.** Briefly describe the function of the following human male reproductive structures: testes, scrotum, epididymis, vas deferens, seminal vesicle, prostate gland, urethra, penis. Be able to locate these on a diagram.
2. **A.** What is semen and what are its contents? **B.** After meiosis occurs in the testes, are the products functional sperm cells? Explain why or why not. How are sperm cells modified for their function? **C.** Why are testes located outside the abdominal cavity? **D.** Why are so many sperm cells required for male fertility?
3. **A.** Briefly describe the function of the following human female reproductive structures: ovaries, oviducts (fallopian tubes), uterus, cervix, vagina. Be able to locate these on a diagram.
4. **A.** Why would you want to put all of the cytoplasm into one functional egg cell at the expense of the others during meiosis? **B.** What is ovulation?
5. **A.** Where does fertilization occur in the female reproductive tract (specifically)? **C.** When is the optimum time for fertilization in the woman's cycle? **D.** If the egg is not fertilized, What happens next?
6. Compare/contrast egg and sperm production given the following parameters: **A.** Name and location of the gonad. **B.** Name of the gamete. **C.** Number of gametes made per month. **D.** When does gamete production begin? **E.** Relative size of gamete.
7. **A.** What is an ectopic pregnancy? **B.** Define the following terms: zygote, cleavage, implantation, placenta.

Parasites

1. Define each of the following terms: symbiosis, parasitism, mutualism, host, vector, reservoir. Give an example for each using the parasites we studied in class.
2. For each of the three general groups of parasites (protozoans, helminths, ectoparasites), describe their main characteristics and give an example for each.
3. Be able to recognize names of the three protozoan parasites discussed in class. For each describe its method of infection/vector and outstanding characteristics (e.g. pathologies/associated diseases or special needs). *Trypanosomes*, *Plasmodium*, *Entamoeba histolytica*.
4. What are the three main groups of helminths? Be able to recognize the names of the four helminths discussed in class. For each describe the methods of infection/vector and any special information about the parasite.
5. Describe the primary characteristics of the ectoparasites discussed in class and give an example of one along with its mode of transmission and associated pathologies.

STUDY GUIDE
Final Exam

1. **A.** In your own words define the term homeostasis. **B.** Name and explain in your own words characteristics of life learned in class that distinguish the living from the non-living
2. **A.** What are chemical elements - how does this relate to biological organisms? **B.** What is a compound? **C.** What is a molecule? Give a few examples. **D.** What are the 4 most common elements found in living things?
3. **A.** What is an atom? **B.** What are the three subatomic particles found in an atom - for each subatomic particle list its charge, atomic mass unit and the location in the atom.
4. **A.** What is a chemical bond? **B.** Name and briefly explain the four types of bonds studied in class.
5. **A.** Draw a simplified pH scale with the numbers 0,7 and 14. **B.** What number would represent an acid? **C.** What number would represent a base? **D.** Name a substance in the body that is acidic, basic and neutral
6. **A.** What are the four main groups of organic compounds or macromolecules studied in class? **B.** Give a few distinguishable characteristics for each of the four organic compound groups. **C.** What is the monomer group for each macromolecule listed above **D.** Be able to recognize the four macromolecules given a diagram.
7. **A.** Why are cells considered the smallest unit of life? **B.** For the following organelles describe their basic function and be able to recognize them on a diagram: plasma/cell membrane, ribosomes,, endoplasmic reticulum (R.E.R., S.E.R), golgi complex, lysosomes, vacuoles, mitochondria,, centrioles, cytoskeleton.
8. **A.** Name the two main components of the fluid mosaic model of the cell membrane and their basic functions. **B.** List 5 ways of moving molecules across a membrane - briefly describe each in terms of energy use, concentration gradient, and size of molecules involved if applicable. **C.** What happens to a cell if you put it in a hypertonic solution? Hypotonic? Isotonic? Why?
9. **A.** In your own words, define cell division. **B.** What two types of cell division have we learned about? **C.** What are the purposes of each type of division? **D.** How is the outcome of mitosis different from meiosis in cell number and chromosome number?
10. **A.** Define in your own words the following terms (use drawings to help explain): chromatin, chromosome, diploid (2N), haploid (N). **B.** Give some reasons why a human would undergo mitosis. **C.** what is the significance of crossing over during meiosis??
11. **A.** Define the following terms, give examples to help explain your answer: gene, allele, genotype, phenotype, homozygous dominant, homozygous recessive, heterozygous.
12. **A.**What is DNA? **B.** Draw a DNA nucleotide and label the three parts - which of these parts actually carries the "code" or directions for proteins? **C.** Where in the cell is DNA found? **D.** Name four differences (physical and/or functional) between DNA and RNA
13. **A.** What is the overall purpose of DNA replication? **B.** When does DNA replication occur? **C.** Describe in your own words the basic steps in DNA replication.

- 14. A.** What does the term protein synthesis mean? **B.** What are the two major steps involved in protein synthesis and briefly describe each (overall - explain how the master "code" found in DNA is ultimately expressed as a protein.) **C.** Be able to read a genetic code sheet from a strand of mRNA.
- 15. A.** What are some functions of the circulatory system? **B.** Name the four chambers of the human heart, the blood vessels leading to and from the heart and be able to follow the pathway of blood through the heart.
- 16. A.** Know where oxy and deoxy blood is found. **B.** How does the lymphatic system work with the circulatory system? **C.** Name the main components of blood (plasma and cellular components)
- 17. A.** Name the major structures of the human respiratory system and give their functions. Be able to locate them on a diagram. **B.** Name at least two functions of the respiratory system.