Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Review Guide/FINAL EXAM**

**Units Covered on Exam Include:**

**Cell Division and Genetics (Chapter 10 &11)**

**Evolution (Chapter 15)**

**Population Ecology (Chapter 4)**

**Body Systems (Chapter 35, Chapter 39, Chapter 40)**

**Ecology (Chapter 3 and 4)**

 Genetics

\_\_\_\_\_\_ 1. genes A. Specific characteristics that vary among individuals

\_\_\_\_\_\_ 2. hybrids B. The offspring of true breeding parents with different traits

\_\_\_\_\_\_ 3. traits C. Factors that determine traits

\_\_\_\_\_\_ 4. alleles D. Sex cells, egg or sperm

\_\_\_\_\_\_ 5. gametes E. The different forms of a gene

6. In FAIRY PEOPLE the allele for YELLOW WINGS (Y) is DOMINANT to BLUE (y). List the phenotype for each of the genotypes shown below.

 YY:\_\_\_\_\_\_\_\_\_\_\_\_ Yy:\_\_\_\_\_\_\_\_\_\_\_ yy :\_\_\_\_\_\_\_\_\_\_\_\_\_

7. In rabbits, B is the allele for black coat and b is the allele for brown coat.

 What is the genotype of a homozygous black rabbit? \_\_\_\_\_\_\_\_\_\_\_\_

 What is the genotype of a heterozygous black rabbit?\_\_\_\_\_\_\_\_\_\_\_\_

8. What % of the offspring will be brown when 2 heterozygous black rabbits mate? \_\_\_\_\_\_\_\_

Complete the Punnett Square below to find the answer. POSSIBLE OFFSPRING

|  |  |
| --- | --- |
|  |  |
|   |  |

 GENOTYPE PHENOTYPE

 \_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

9. Purple Toes are dominant to pink toes. If a heterozygous women marries a pink toed man, what percent of their offspring will have pink toes? Use a Punnett square to show your work.

10. What is a sex-linked trait?

11. Which sex (male or female) is more likely to have a sex-linked trait passed on? Why?

12. In fruit flies, eye color is a sex-linked trait. Red is dominant to white.

 a. What are the sexes and eye colors of flies with the following genotypes:

 XRXr : \_\_\_\_\_\_\_\_\_\_ XRY: \_\_\_\_\_\_\_\_\_\_ XrXr: \_\_\_\_\_\_\_\_\_

 XRXR: \_\_\_\_\_\_\_\_\_\_ XrY: \_\_\_\_\_\_\_\_\_\_

 b. What are the genotypes of these flies:

 White eyed, male: \_\_\_\_\_\_\_\_\_ red eyed female (heterozygous): \_\_\_\_\_\_\_

 White eyed, female: \_\_\_\_\_\_\_\_ red eyed, male: \_\_\_\_\_\_\_\_\_

c. Show the cross of a white eyed female XrXr with a red eyed male XRY in a Punnett square.

13. Following a Pedigree

 The affected members of the family all have curly hair, a dominant trait in humans. Trace the curly hair in the following pedigree. **For each person write their possible genotype below their symbol on the diagram.**



1. Females are represented by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Males are represents by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The shaded shapes represent:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How many generations are shown in the pedigree? \_\_\_\_\_\_\_\_

**Mitosis and Meiosis**

1. Explain the similarities and differences between haploid and diploid cells.
2. Complete the Comparison Table Below

|  |  |  |
| --- | --- | --- |
| **Feature** | **Mitosis** | **Meiosis** |
| **Number of daughter cells**(2 or 4) |  |  |
| **Number of chromosomes** ( are they haploid or diploid) |  |  |
| **Genetic similarity** (identical or varied) |  |  |
| **Type of cells** |  |  |
| **How many divisions does each go through** |  |  |

1. A cell spends the majority of its life in this part of the cell cycle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, where it grows and replicated chromosomes.

**Evolution**

1. DDT is an insecticide that was first used in the 1940s to kill mosquitoes and stop the spread of malaria. At first, it was very effective. However, over a period of years, people began to notice that it was becoming less and less effective. However, over a period of years, people began to notice that it was becoming less and less effective. A possible explanation was that the insects were becoming “resistant” to the DDT. Explain how the resistance may have evolved.

2. Write a paragraph in which you explain the competitive exclusion principle . Use the words: *reproduction, competition, food, resources (Hint.think of a few examples and choose 2 to write about, has to do with evolution).*

1. Read the following paragraph and answer the questions below:

Organisms require food and water to survive. Since there isn’t always an endless amount of food and water, there are limiting factors. Suppose a bear must eat 10 fish a day to survive. The river nearby provides about 100 fish a day without harming the fish population. Five bears could easily live in this area because they would only need 50 fish total. But if there were 15 bears they would not all survive because there would not be enough food. No matter how much shelter and water there was, the population would not get larger than 10 bears for any extended period of time.

 a. How can food and water limit population growth?

 b. Is food a limiting factor for plants? Why or Why not (think about adaptations)?

4. Summarize the 5 main concepts of Darwin’s theory of evolution

(pg 386 in your text book).

 1.

 2.

 3.

 4.

 5.



5. What is carrying capacity (refer to the graph above for help)?

6. How are limiting factors such as food and space related to carrying capacity?

7. Define

 a. Immigration-

b. Emigration-

1. Describe shapes of the three types of population pyramids. Provide possible factors that may cause each type of population pyramid.

**Nervous System**

Part A: Definitions: Define the following terms, **IN YOUR OWN WORDS, IN AS FEW WORDS AS CLARITY ALLOWS**.

|  |  |
| --- | --- |
| Myelin sheath |  |
| PNS |  |
| CNS |  |
| nerve |  |
| Somatic nervous system |  |
| reflex arc |  |
| Autonomic nervous system |  |
| Spinal cord |  |
| Cerbral cortex (cerebrum) |  |

**Part B - Short Answers**

1. The peripheral nervous system may be divided into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ division and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ division.
2. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nervous system causes the heartbeat to slow down.
3. The central nervous system contains the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The somatic nervous system controls \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ muscles. The autonomic controls \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ muscle and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. The autonomic has two parts, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for emergency situations, and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for everyday situations.
6. Label the neuron below.



1. Which structure above is most responsible for the fast speed of nerve transmission? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Across which “spaces” do nerve impulses “jump”? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. List the structures, in order, that a nerve impulse would travel through this neuron. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Fill in the blanks to indicate what happens during a spinal reflex arc. A stimulus is received by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organ, which initiates an impulse in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ neuron. The neuron takes the message to the cord and transmits it to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This neuron passes the impulse to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ neuron, which takes the message from the cord and innervates a muscle causing a reaction to the stimulus.
5. Fill in the table below to indicate the functions of the parts of the brain.

|  |  |
| --- | --- |
| **Part** | **Function** |
| cerebrum |  |
| hypothalamus |  |
| cerebellum |  |
| pituitary |  |

**Immune System**

**True or False**

*Write true if the statement is true or false if the statement is false, correct the statement.*

\_\_\_\_\_\_ 1. Pathogens are physically forced out of the respiratory tract when a person coughs.

\_\_\_\_\_\_ 2. In a healthy human, the skin’s surface contains no bacteria.

\_\_\_\_\_\_ 3. Pathogen is a technical term for germ.

\_\_\_\_\_\_ 4. All immune system responses are specific; there are no nonspecific defenses.

\_\_\_\_\_\_ 5. Mucus made by the respiratory system is the 2nd line defense

\_\_\_\_\_\_ 6. The main function of red blood cells is to make antibodies.

\_\_\_\_\_\_ 7. Histamines reduce inflammation.

\_\_\_\_\_\_ 8. The third line of defense is nonspecific.

\_\_\_\_\_\_ 9. The base of a Y-shaped antibody is the part of the protein that binds specifically to an antigen.

\_\_\_\_\_\_ 10. Inflammation of the skin can result from a bee sting.

\_\_\_\_\_\_ 11. Histamines stimulate inflammation.

**Critical Reading**

*Read this passage from the lesson and answer the following questions.*

**First Line of Defense**

The immune system has three lines of defense. The first line of defense includes a variety of barriers against pathogens that keep most pathogens out of the body. Pathogens are disease-causing agents, such as bacteria and viruses. Defenses in the first line are the same regardless of the type of pathogen. This is why they are called nonspecific defenses.

**Mechanical Barriers**

Mechanical barriers physically block pathogens from entering the body. **The skin** is the most important mechanical barrier. In fact, it is the single most important defense of the body against pathogens.

At body openings, such as the mouth and nose, the body has a different mechanical barrier. Instead of skin, mucous membranes line these and other organs that are exposed to the outside environment. **Mucous membranes secrete mucus, a slimy substance that coats the membranes and traps pathogens**. Mucous membranes also have cilia, which are tiny projections that have wavelike motions. The movements of cilia sweep mucus and trapped pathogens toward body openings to be removed from the body.

Pathogens are removed from the respiratory tract when you sneeze or cough. In addition, tears wash pathogens from the eyes, and urine flushes pathogens out of the urinary tract. Chemical Barriers

Chemical barriers are proteins that destroy pathogens at the body’s surface. The skin and mucous membranes secrete proteins that kill many of the pathogens with which they come into contact. For example, enzymes called **lysozymes**—**which are found in sweat, mucus, tears, and saliva—kill pathogens by breaking open their cell walls**.

**Questions**

18. Name and briefly describe the immune system’s first line of defense.

19 How can the skin be considered part of the immune system?

20. What are mucous membranes? Where are they found?

**Multiple Choice**

*Circle the letter of the correct choice.*

21. A component of the immune system’s first line of defense is

d. the spine.

c. the skin.

b. antibodies.

a. cytokines.

22. Lysozymes

d. produce acid from protein.

c. are antibodies that bind to red blood cells.

b. are enzymes that break down bacterial cell walls.

a. are enzymes that break down histamines.

23. Mucus is produced by

d. none of the above

c. by the respiratory tract, but not by the intestinal tract.

b. by healthy tissues, including the respiratory tract and intestinal tract.

a. only damaged respiratory passages.

24. When bacteria enter the body through a cut in the skin

d. the immune system shuts down.

c. the third line of defense of the immune system is activated within seconds.

b. the first line of defense of the immune system has succeeded.

a. the second line of defense of the immune system is activated.

25. A chemical that is produced as a part of the inflammatory response is

d. flagella.

c. cilia.

b. monoamine.

a. histamine.

26. Allergic symptoms of sneezing and itchy, watery eyes can often be treated effectively with

d. histamines.

c. antihistamines.

b. antibiotics.

a. aspirin.

27. In one type of immunotherapy used to treat allergic symptoms,

d. the allergen is removed from a person’s system.

c. a person is injected repeatedly over time with an allergen to which they are sensitive, with the goal of reducing the person’s sensitivity to that allergen.

b. all T cells are inactivated.

a. the antigen is removed from the person’s environment.

30. Why is the third line of defense referred to as specific defense? (What does is “attack” pathogens with?)

31. What are the three proteins found on red blood cells that make up your blood type?

 a.

 b.

 c.

10. Why is type AB+ considered the universal recipient? Explain in terms of antibodies and antigens.

**Hormones and the Endocrine System Worksheet**

**The Body’s Activity Are Coordinated**

***Mark each statement below T if it is true or F if it is false.***

\_\_\_\_\_\_ 1. Hormones are substances secreted by cells that act to regulate the activities of other cells in the
 body.

\_\_\_\_\_\_ 2. Hormones are not carried in the bloodstream from one cell to another.

\_\_\_\_\_\_ 3. A hormone carries one signal that has the same effect in all of the cells that receive the signal.

\_\_\_\_\_\_ 4. Certain hormones coordinate the production, use and storage of energy.

\_\_\_\_\_\_ 5. Hormones do not react to stimuli from outside the body.

**Hormones are made in Certain Organs and Tissues**

***Read each question, and write your answer in the space provided.***

**Hormones Act on Specific Cells**

***Complete each statement by underlining the correct term or phrase in the brackets.***

7. A [target / receptor] cell is a specific cell on which a hormone acts.

8. A receptor is a [protein / fatty acid] to which a molecule binds.

 9. Directions: Listed below are the major hormones produced by the human body.

 Next to each gland listed below, write a brief description of what it does.

 pituitary\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

thyroid\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ adrenal\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

pancreas\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. What is the difference between complimentary hormones and feedback inhibition (also known as interior feedback)? Why are they important?

**ECOLOGY REVIEW SHEET**

**I. Matching**

**Match the following terms with the correct statement. Each statement may be used only once.**

1. An organism that eats only plants
2. Study of organisms and their environment
3. Gradual replacement of one community by another
4. Organisms that cannot make their own food
5. Where an organism lives
6. Organisms that can make their own food
7. An organism that hunts
8. Organisms that eats only meat
9. Organism that breaks down dead material
10. The role organisms have within their environment, how they eat or behave
11. Organism that eats both plant and animals
12. Organism that are hunted

Heterotroph 1.

Secondary Succession 2.

Ecology 3.

Prey 4.

Carnivore 5.

Autotroph 6.

Habitat 7.

Herbivore 8.

Decomposer 9.

Omnivore 10.

Predator 11.

Niche 12.

**II. FILL IN THE BLANK**

**In the space to the left, write the word or phrase in parentheses that correctly completes the statement**

 13. The biosphere includes air and water; animals and plants; and (mountains and oceans, moon and stars).

 14. Wind, humidity, and (mosses, rocks) would be considered abiotic factors in a terrestrial ecosystem.

 15. The size and extent of a population does not directly depend on the availability of (food, decomposers).

 18. Energy that passes through a food chain is lost to the environment as (heat, matter).

 19. Water, carbon, and nitrogen are released back into the atmosphere during (symbiosis, decomposition).

 20. In a pond ecosystem, ducks, mosquitoes, pond plants, and frogs are (abiotic, biotic) factors.

**Use the following diagram to answer questions.**

 Caterpillar Bird

Grass Mouse Snake Owl

 Grasshopper Frog

21. What is the producer in the food web above?

22. Energy flows from the mouse to the \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_

23. The primary consumers are \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

24. The secondary consumers are \_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_, and \_\_\_\_\_\_\_.

1. The owl is a secondary consumer if it eats the \_\_\_\_\_\_, but a tertiary (third order) consumer if it eats the \_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_.
2. As matter and energy move from grasses to owl, the amount of available energy always **(increases, decreases)** but the population size may increase or decrease.

27. Explain the difference between a niche and habitat.

 Niche:

 Habitat:

28. Compare and contrast a food chain and a food web. Food Chain:

 Food Web:

29. Compare and contrast primary and secondary succession.

Primary:

 Secondary:

1. In an ecological pyramid, what happens to the energy as you go up the pyramid?
2. What is the 10% rule? What is its significance? Why is energy lost?
3. Describe the two different methods we discussed in class that can be used to assess water quality.