**4.12 Unit Test Study Guide**

This worksheet was developed to help you prepare for the 4.12 Unit 4 Test in Biology 202 with Mrs. Ulry. Please take your time and answer each and every question fully … *You may use your lessons, notes, and/or other resources to help you!* Feel free to print out this document and write your answers or just add your answers in “Word.” Contact me with any questions!

**The Work of Gregor Mendel:**

1. The passing of genetic information from parents to their offspring is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

2. Gregor Mendel’s work was different from other scientists of the time because he used rigorous

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to complete his experiments. (1 point)

3. True or False. Mendel is considered the father of modern genetics. (1 point)

4. List four of the characteristics that Mendel investigated when studying his pea plants. *HINT: The lesson lists seven of them.* (4 points)

5. During Mendel’s time, most people believed in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ inheritance. This means that parents’ traits mix together to create offspring with intermediate traits. (1 point)

6. Mendel’s work found that, when cross breeding pea plants, traits did not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over the generations. (1 point)

7. Today, we call Mendel’s “factors,” \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

8. We also recognize that each gene has two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They can either be dominant or recessive. (1 point).

9. What is the difference between something that is *homozygous*, versus something that is *heterozygous*? (2 points)

10. True or False. Mendel’s work with genetics was not immediately recognized as being important. (1 point)

**Mendelian Inheritance:**

11. Alleles (or the “units” Mendel spoke of) separate during the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

12. Alleles of different genes are separated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of one another. (1 point)

13. Fill in the table by defining the following terms. (4 points)

|  |  |
| --- | --- |
| **Vocabulary Term** | **Definition** |
| **Dominant Trait** |  |
| **Recessive Trait** |  |
| **Genotype** |  |
| **Phenotype** |  |

14. What is a Punnett Square? (1 point)

15. Using the example shown on slides #9-11, what *genotype and phenotype* can you expect if you cross a homozygous red and homozygous brown-eyed fly? (2 points)

16. Create a Punnett Square of your own to show what type of offspring a cat with black fur (BB) and a cat with white fur (bb) might create. (6 points)

17. If the trait of “fur color” in cats is an example of normal dominance, what color kittens could you expect from the parent you just crossed in the Punnett Square? (1 point)

18. In genetics, we often use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to determine the likelihood that a specific allele will occur in a gamete. (1 point)

19. In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ offspring will have an intermediate phenotype to their parents. (1 point)

20. The following Punnett Square shows a cross between a red butterfly (RR) and a blue butterfly (BB). The color of these butterflies is determined by “incomplete dominance.” Please answer the following questions using the completed Punnett Square (below).

**R**

**R**

**B**

**BR**

**BR**

**B**

**BR**

**BR**

1. What are the genotypes of the offspring? ( 1 point)
2. What are the phenotypes of the offspring? (1 point)

**Chromosomes and Genes:**

21. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a segment of DNA. (1 point)

22. Different forms of a gene are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

23. Genes are located on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

24. Humans have \_\_\_\_\_\_\_\_\_\_\_ chromosomes which are all located in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of their cells. (2 points)

25. What is a karyotype? (1 point)

26. List three different abnormalities that karyotypes can identify. (3 points)

**Genes and Alleles:**

27. Genes function by producing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

28. Different alleles have different \_\_\_\_\_\_\_\_\_ sequences, which produce different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the offspring. (2 points)

29. A variation in the allele for hemoglobin can result in what disease? (1 point)

30. When alleles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ both are expressed in individuals who are heterozygous for the trait. (1 point)

31. Using the example with hemoglobin in the lesson (slide #9), what two alleles are present if a person has normal and sickle-shaped red blood cells? (1 point)

**Proteins Express DNA:**

32. What is gene expression? (1 point)

33. The two processes used to make proteins are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (2 points)

34. In order to make proteins, DNA must be transcribed into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (1 point)

35. All of our body cells contain the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ DNA. (1 point)

36. Cell differentiation is caused by genes being turned \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_. (2 points)

37. What regulates gene expression? (1 point)