Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

# HONORS BIOLOGY FINAL STUDY GUIDE

# Genetics

1. Who discovered the principles of inheritance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. What are the sex chromosomes for a male? \_\_\_\_\_\_\_, a female? \_\_\_\_\_\_\_\_

3. Who determines the sex of a child? \_\_\_\_\_\_\_\_\_\_\_\_\_

4. Define *phenotype* –

5. Define *genotype –*

6. Define *multiple alleles –*

7. Define *polygenic traits* –

8. Define *codominance –*

9. Define *incomplete dominance –*

10. A person with type B blood would have the genotype \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. What is replication? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What is translation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. What is transcription? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. Who discovered the structure of DNA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. What are the 3 differences between RNA and DNA?

16. What is the ultimate expression of our genes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17. What scientist(s) is credited with discovering the structure of DNA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. If 10% of a strand of DNA is thymine, how much is guanine? \_\_\_\_\_\_\_\_

19. Define *codon –*

20. Define *anticodon* –

21. What is the overall structure of DNA? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. What is the relationship between DNA, genes, and chromosomes?

23. Describe the different types of point mutations.

# 24. What is an autosome?

25. What is the function of DNA ligase?

DNA polymerase:

DNA Helicase:

RNA polymerase:

26. What are the three types of RNA discussed in class and what are their functions?

# Problems and Labels

27. Tall plants are dominant over short. If a heterozygous tall plant is crossed with a short plant, what would the genotypic and phenotypic ratio be?

28. Purple flowers are dominant over white flowers. The two parent plants are purple, but the offspring is white. What are the genotypes of the parent plants?

29. What blood types could a child be with a father with Type B blood and a mother with type O?

30. Fill out the chart below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| cDNA |  |  |  |  |  |
| DNA | G C C | A T A | A G T | A C T | C G T |
| mRNA Codon |  |  |  |  |  |
| Anti-codon |  |  |  |  |  |
| Amino Acid |  |  |  |  |  |

**Biotechnology**

31. What is gel electrophoresis and what is it used for?

32. What is a DNA Microarray and what is it used for?

33. What two characteristics of DNA allows for the separation of DNA fragments?

34. What steps are used to clone a gene?

35. What is polymerase chain reaction (PCR) and what is it used for?

36. Define *genetically modified organism –*

37. Define *Selective breeding –*

38. What types of impact has genetic engineering had on society?

**Natural Selection**

39. What are the main points of the theory of natural selection?

40. Describe an organism that would be considered “fit.”

41. What is a *homologous structure?*

42. Describe *reproductive isolation*.

43. What is the difference between an observation and an inference?

44. What are the sources of genetic variation?

45. Define *gene flow –*

46. Define *founder effect –*

47. Define *bottleneck effect –*

48. What is a *vestigial structure?*

49. What is some evidence for evolution?

**Ecology**

Trees (berries) 🡪 mouse 🡪 snake 🡪 hawk

50. What is the source of energy for this food chain? \_\_\_\_\_\_\_\_

51. Which of these organisms are producers? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

52. In this food chain, what is the primary consumer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

53. Which is a third order carnivore? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

54. At what level do decomposers play a role? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Examine the food web below and answer the questions that follow

Hint: Prey Predator

Coyotes

Spiders Pocket gophers

Rabbits

Insect-eating birds Snakes Grasses/shrubs

Frogs Hawks/owls

Insects Lice

Seed-eating birds

Bacteria

55. Give a few examples of herbivores?

56. Give me some examples of a first order consumer?

57. Give me some examples of producers?

58. Give me some examples of third order consumers?

59. Define *population* –

60. Define *community –*

61. Define *habitat –*

62. Define *succession –*

63. Define *commensalism –*

64. Define *parasitism –*

65. Define *predation –*

66. Define *mutualism –*

67. What happens to the energy level as you move up the food chain?

68. Define *trophic level -*

69. Define *competition –*

70. Summarize the water cycle.

71. Summarize the carbon cycle.

72. What are some examples of limiting factors?

73. What is the difference between density-dependent and density-independent factors?

74. Define *carrying capacity –*

75. Why are food chains limited to 4 or 5 organisms?