

# Review for Semester 2 Exam 2007

## Genetics

1. How is the genetic information transmitted from parents to offspring?

2. What shape is DNA, and how is it stored in cells?

3. Compare and contrast meiosis and mitosis.

Meiosis	Mitosis

4. Define:

a. Somatic:

b. Haploid:

c. Diploid:

d. Phenotype:

e. Genotype:

5. How can inserting, deleting, or substituting DNA segments alter a gene?

6. How can an altered gene be passed on to every cell that develops from it?



17. Define and give examples for each term:

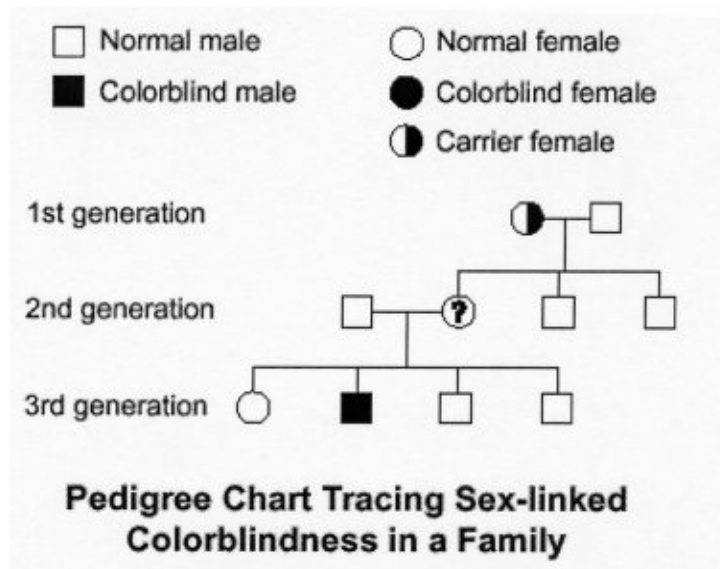
Term	Definition	Example
Dominant		
Recessive		
Sex-linked trait		
Incomplete dominance		
Codominance		
Allele		

18. How many unique gametes can be made from an organism with a haploid chromosome number of 22 ( $n=22$ )?

19. What are some examples of how inherited characteristics can be observed at the whole-organism level – in structure, chemistry, or behavior?

20. What is the phenotype of the woman in the 2<sup>nd</sup> generation (labeled “?”)? \_\_\_\_\_

21. What is the genotype of the woman in the 2<sup>nd</sup> generation (labeled “?”)? \_\_\_\_\_



22. Understand how to use Punnett squares to predict genotypes and phenotypes of offspring.

# Evolution

23. What is a scientific theory?

24. Complete the table:

Term	Definition	Examples
Homologous structures		
Vestigial structures		

25. How does genetic (DNA) evidence support anatomical evidence (paleontology) for evolution?

26. What does the genetic evidence tell us about relationships between species?

27. Describe the process of natural selection.

28. Explain how natural selection leads to organisms that are well suited for survival in particular environments by answering these questions:

a. Why does a hawk have sharp talons?

b. Why does a snowshoe hare (rabbit-like animal) turn white in the winter?

c. Why does a giraffe have a long neck?

29. The proportion of individuals in the population that have advantageous characteristics will \_\_\_\_\_ over time.

30. How does natural selection provide a scientific explanation for the history of life on Earth as depicted in the fossil record?

31. How does natural selection provide scientific explanation for the history of life on Earth as depicted in the similarities evident within the diversity of **existing** organisms?

32. Life on Earth is thought to have begun as simple, \_\_\_\_\_ about \_\_\_\_\_ years ago.

a. During the first \_\_\_\_\_ billion years, **only** \_\_\_\_\_ existed.

b. Once cells with \_\_\_\_\_ developed about \_\_\_\_\_ billion years ago, increasingly complex \_\_\_\_\_ organisms evolved.

33. Respond to the following statements:

a. Organisms can choose to evolve.

b. Populations evolve, individuals do not.

34. Which three things are necessary for evolution to occur?

a.

b.

c.

35. Prior to the studies of Charles Darwin, what was the most widespread belief regarding the diversity of organisms?

36. What did Darwin's research lead him to conclude about organisms?

37. Gregor Mendel contributed to the study of life and inheritance by doing what?

# Ecology

38. Review ecology terms. These will get you started:

<b>Term</b>	<b>Definition</b> <i>(Where does their energy come from?)</i>	<b>Example</b>
Biotic		
Abiotic		
Heterotroph		
Autotroph		
Herbivore		
Carnivore		
Omnivore		
Scavenger		
Decomposer		
Ecosystem		
Niche		
Population		
Climax community		
Biodiversity		
Habitat		
Food web		
Food chain		
Density dependant factor		
Density independent factor		



47. What happens to the stored energy in fossil fuels when we burn them?

48. Name 3 **abiotic** factors. How might these abiotic factors in your environment affect your life?

a.

b.

c.

49. Name 3 **biotic** factors. How might biotic factors in your environment affect your life?

a.

b.

c.

50. Describe the flow of energy within ecosystems.

51. Describe the flow of carbon within ecosystems.

52. Describe the flow of nitrogen within ecosystems.

53. Which is more likely to survive: an ecosystem with many different species or an ecosystem with very few species? ***Explain your answer!***