

Standard 4 Objective 2 Predict and interpret patterns of inheritance in sexually reproducing organisms

23 Question(s)
Test ID: 2142483954

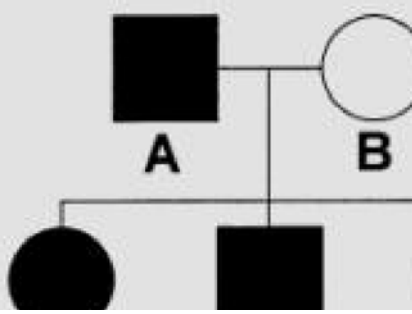
Name: _____

Date: _____

- 1) A family with a history of breast cancer has been given an opportunity to have all family members tested for the BRCA2 breast cancer gene. The presence of even a single copy of the detrimental gene indicates a significantly higher risk for a carrier; two copies elevates the risk even higher. One branch of the family (1) wishes to be tested immediately but another (family 2) wishes not to be tested.
What would a genetic counselor say to the families?
 - A. There is no chance these families will be affected by the disorder, therefore testing is not necessary
 - B. There is no chance these families will be affected by the disorder, but testing will be required by the counselor
 - C. There is a chance that one or more family members will be affected, so testing is required
 - D. There is a chance that family members will be affected, but testing will be up to the individuals
- 2) What is the probability of two heterozygous parents having a child that is homozygous dominant?
 - A. 1/8
 - B. 1/4
 - C. 1/2
 - D. 1
 - E. 2
- 3) In a cross involving simple dominance, using B = Black hair and b = blonde hair, if you have a male who is heterozygous crossed with a homozygous dominant female, what percent of their offspring will have blonde hair?
 - A. 0
 - B. 25
 - C. 50
 - D. 75
 - E. 100
- 4) Mary has natural blonde hair. Both of her parents have natural brown hair. In humans, brown is dominant and blonde is recessive. Choose the genotype that best describes Mary's parents.
 - A. Bb and Bb
 - B. BB and Bb
 - C. BB and BB
 - D. bb and BB
 - E. bb and bb
- 5) Which of the following is an inference?
 - A. Selective breeding produces organisms with resistance to specific diseases
 - B. Selective breeding creates larger fruits, such as strawberries
 - C. Milk production in cows can be increased by selective breeding
 - D. Humans who eat hybrid cows will become immune to infections
- 6) How did people respond to Mendel's ideas on inherited traits?
 - A. immediately accepted by his peers
 - B. thought to be far ahead of their time
 - C. not recognized for more than thirty years
 - D. found to be out of date even then
 - E. lost and have never been found
- 7) Using T = tall and t = short. If a heterozygous male crosses with a heterozygous female, what is the genotype ratio?
 - A. 2:2
 - B. 4:0
 - C. 3:1
 - D. 3:3
 - E. 1:2:1

8) In the pedigree above, the shaded individuals are homozygous recessive.

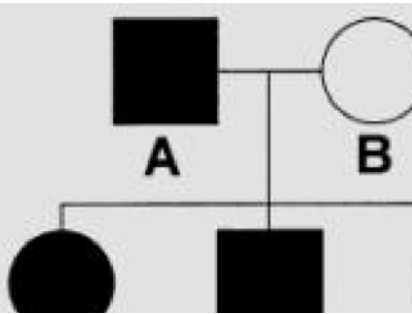
What is the genotype of individual B?



- A. heterozygous
- B. homozygous recessive
- C. homozygous dominant
- D. can not tell from the diagram

9) In the pedigree above, the shaded individuals are homozygous recessive.

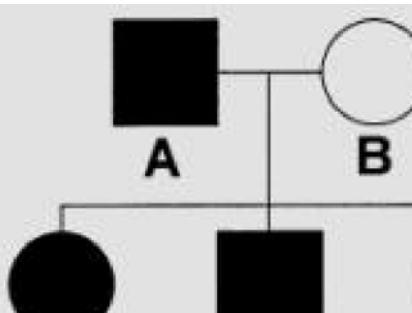
What is the genotype of individual E?



- A. heterozygous
- B. homozygous recessive
- C. homozygous dominant
- D. can not tell from the diagram

10) In the pedigree above, the shaded individuals are homozygous recessive.

If individual E married an individual who is homozygous recessive, what is the probability that their first child will be homozygous recessive?



- A. 1/8
- B. 1/4
- C. 1/2
- D. 1

11) From the information shown above, what % of the offspring will be heterozygous?

	R	
R	RR	

- A. 0
- B. 25
- C. 50
- D. 75
- E. 100

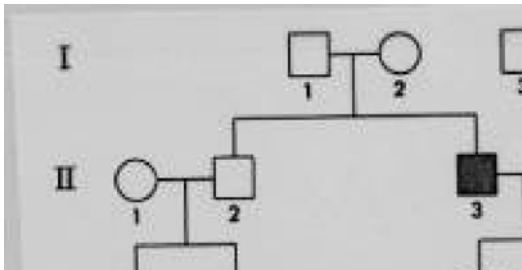
12) Which breeding system reduces genetic variation in a population?

- A. Crossbreeding
- B. Linebreeding
- C. Inbreeding
- D. Outcrossing
- E. Outbreeding

13) The creeper syndrome in chickens is due to a recessive condition that results in the severe shortening of the legs. A chicken producer mates a rooster (Cc) to hens that are carrying the creeper gene also (Cc). What are the expected genotypic and phenotypic ratios of the offspring of each hen?

- A. 2 normal chickens (CC), 2 creepers (cc)
- B. 2 normal chickens (CC), 1 creeper (cc), 1 carrier (Cc)
- C. 3 normal chickens (CC), 1 carrier (Cc)
- D. 1 normal chicken (CC), 1 creeper (cc), 2 carriers (Cc)
- E. 1 normal chicken (CC), 2 creepers (cc), 1 carrier (Cc)

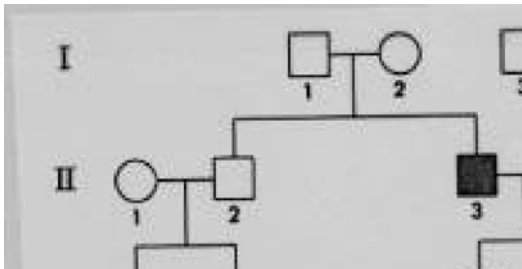
14) The following pedigree chart shows sex-linked inheritance of color blindness for three generations of a family. Review the pedigree chart. Answer the following question.



What is genotype of Individual #4 of the second generation?

- A. $X^{C}X^{C}$
- B. $X^{C}X^{c}$
- C. $X^{C}Y$
- D. $X^{c}Y$

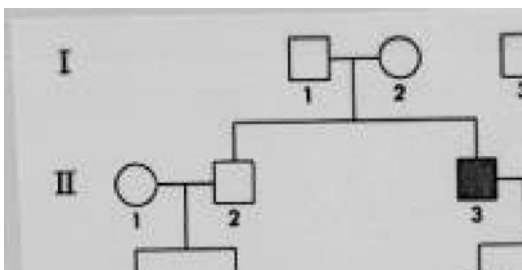
15) The following pedigree chart shows sex-linked inheritance of color blindness for three generations of a family. Review the pedigree chart. Answer the following question.



What is the genotype of Individual #2 of the third generation?

- A. $X^{C}X^{C}$
- B. $X^{C}X^{c}$
- C. X^{C}
- D. $X^{c}Y$

16) The following pedigree chart shows sex-linked inheritance of color blindness for three generations of a family. Review the pedigree chart. Answer the following question.

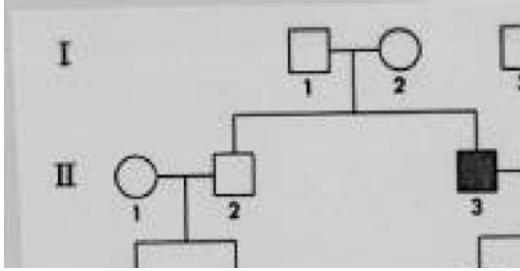


According to the pedigree, who is passing on the genes for color-blindness to Individual #4 of the

third generation?

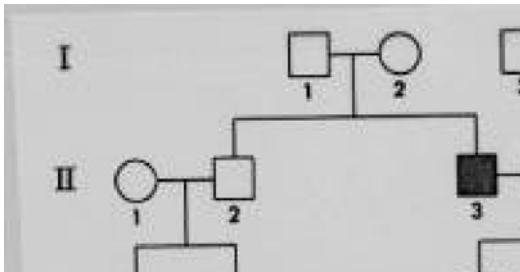
- A. Individual #3 of the second generation
- B. Individual #4 of the second generation
- C. Individuals #3 and #4 of the second generation
- D. Individuals #2 and #3 of the second generation

- 17) The following pedigree chart shows sex-linked inheritance of color blindness for three generations of a family. Review the pedigree chart. Answer the following question.



What type of trait is color-blindness?

- A. Dominant
 - B. Recessive
 - C. Codominant
 - D. Multiple Allele
- 18) The following pedigree chart shows sex-linked inheritance of color blindness for three generations of a family. Review the pedigree chart. Answer the following question.



What is the genotype of Individual #2 in the first generation?

- A. $X^{C}X^{C}$
 - B. $X^{C}X^{c}$
 - C. $X^{C}Y$
 - D. X^{c}
- 19) From the information shown above, if the red phenotype is dominant, what % of the offspring will show the red phenotype?

	R	
R	RR	
	r	

- A. 75
 - B. 50
 - C. 25
 - D. 100
 - E. 0
- 20) Building on the early work of a British farmer, T. A. Knight, Gregor Mendel was one of the first persons to think and write about segregation and the independent assortment of genetic traits. What has happened to his ideas?
- A. Through the work of many persons, his laws have been modified and expanded.
 - B. Scientists have since disproved almost all of Mendel's ideas.
 - C. Mendel's "Laws" have been proven to be just as he said.
 - D. Though his ideas are still accepted, we do not yet have any hard evidence for them.
- 21) A couple wishes to have children and they think they might both be carrying genes for a genetic disorder called sickle cell anemia. They are tested with an approved test called a DNA probe, which can detect the presence of this gene. Some people believe there should be laws against human DNA research. What does this show about how science affects people?

- A. Science provides the information and technology to destroy all genes causing diseases.
 - B. Two people cannot have children if they are each found to carry the gene.
 - C. The whole statement is false since diseases are only caused by microorganisms.
 - D. Science provides technology so parents can make informed choices about the risks of having genetically impaired offspring.
- 22) A couple wishes to have children and they think they might both be carrying genes for a genetic disorder called sickle cell anemia. They are tested with an approved test called a DNA probe, which can detect the presence of this gene. Some people believe there should be laws against human DNA research. What does this show about how science affects people?
- A. Science provides information to inform policy makers and the public about ethical issues.
 - B. Science provides the information and technology to destroy the genes that cause disease.
 - C. Science tells people they cannot have children if they have bad genes.
 - D. Science frightens people because there are so many reports in the news about genetic mutations.
- 23) One of the ways information about genetics can be used is to cure genetic disorders by gene therapy (the replacement of the defective gene with a normal gene). A virus is used to deliver the gene into the nucleus of the affected cell. Trials in patients with cystic fibrosis (CF) show that gene therapy is successful in reducing the presence of CF in the cells of afflicted children. What does this demonstrate?
- A. Science provides the information and technology to destroy all genes causing diseases.
 - B. Two people cannot have children if they are each found to carry the gene that causes cystic fibrosis.
 - C. Scientists should create laws to allow gene therapy.
 - D. Science uses technology so parents can make informed choices about prevention of cystic fibrosis in their offspring.

