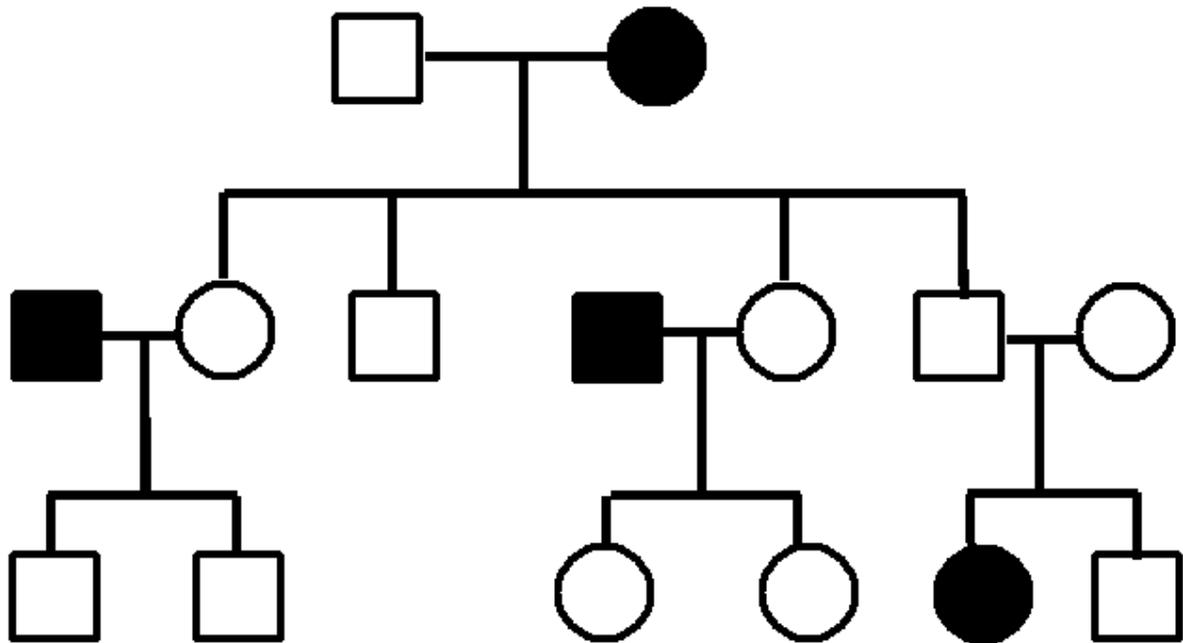


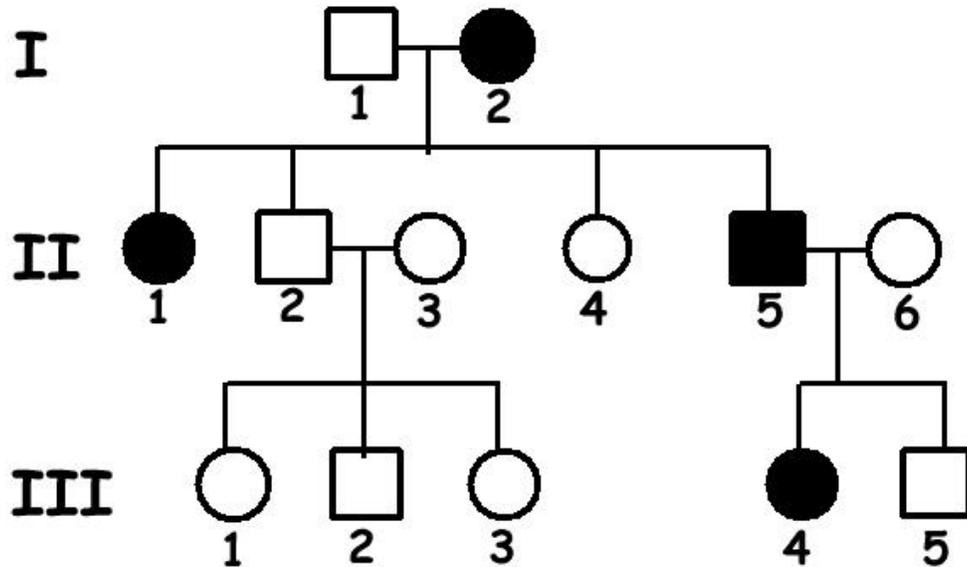
MENDELIAN GENETICS IN HUMANS

PEDIGREES



QUESTIONS:

1. Use the information provided below to answer the questions that follow.



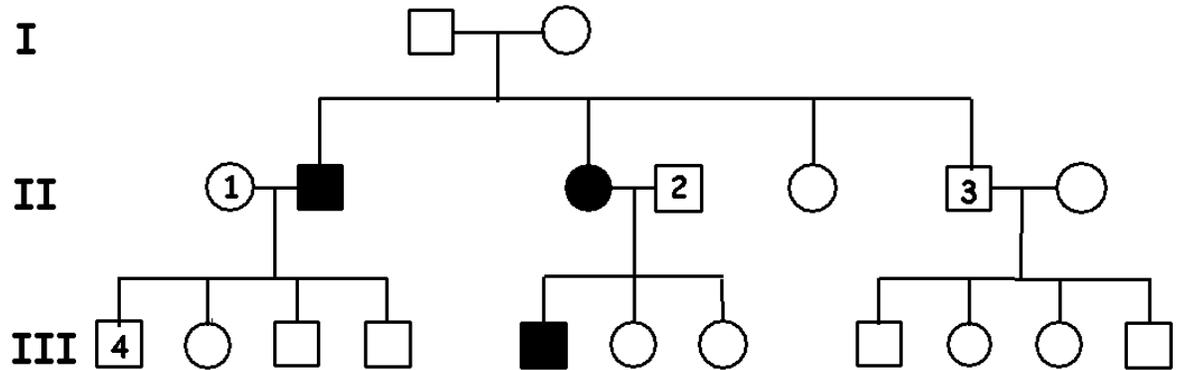
a. List the sex of the children, in order of birth, produced by the parents in Generation I.

b. Is the trait being tracked in this pedigree dominant or recessive? How do you know?

c. How many children did individuals 2 and 3 in Generation II produce?

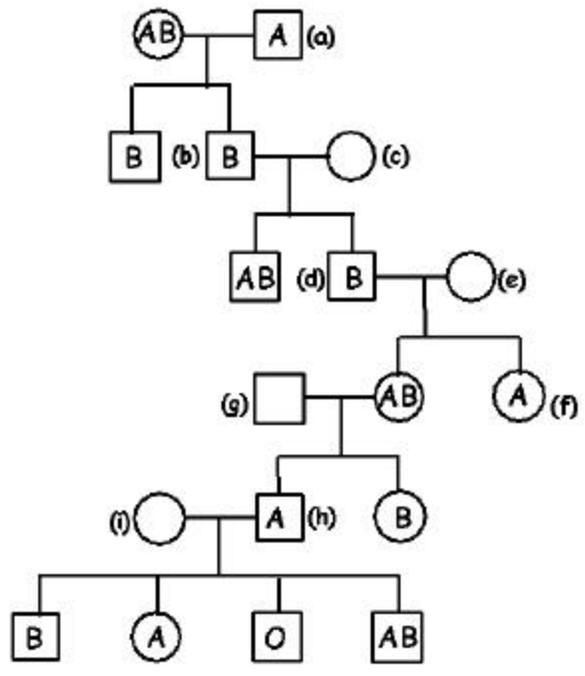
d. What is the relationship of individual 6 in Generation II to the couple in Generation I?

2. Albinism (lack of skin pigmentation) is caused by a recessive allele. Consider the following human pedigree for this trait (solid symbols represent individuals who are albinos).



- What are the genotypes of father and mother in Generation I?
 Father: _____ Mother: _____
- In Generation II, what is the genotype of:
 Mate 1 _____ Mate 2: _____
- In Generation III, what is the genotype of son 4? _____
- Can you predict the genotype of son 3? Explain.

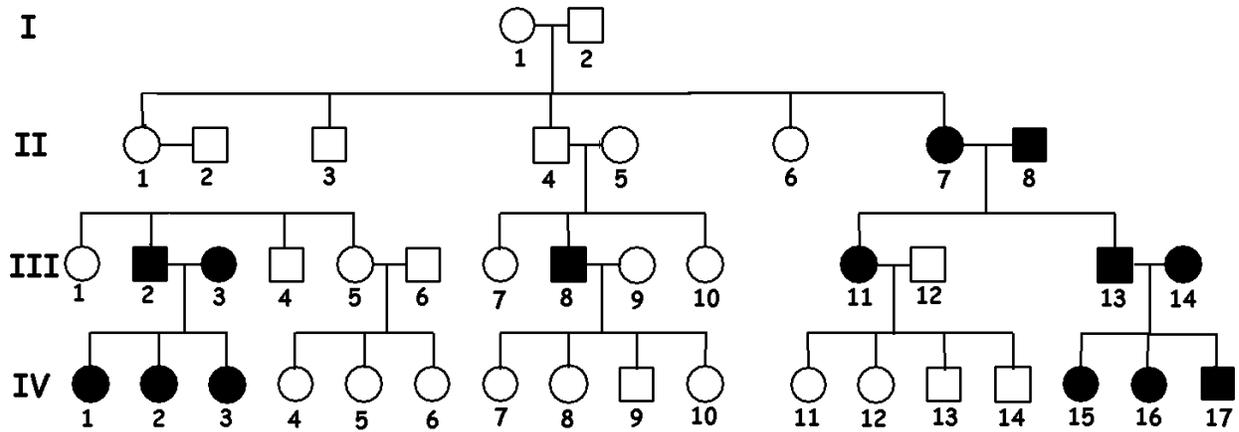
3. The pedigree below shows the ABO blood group for a family.



What is the genotype for the following individuals?

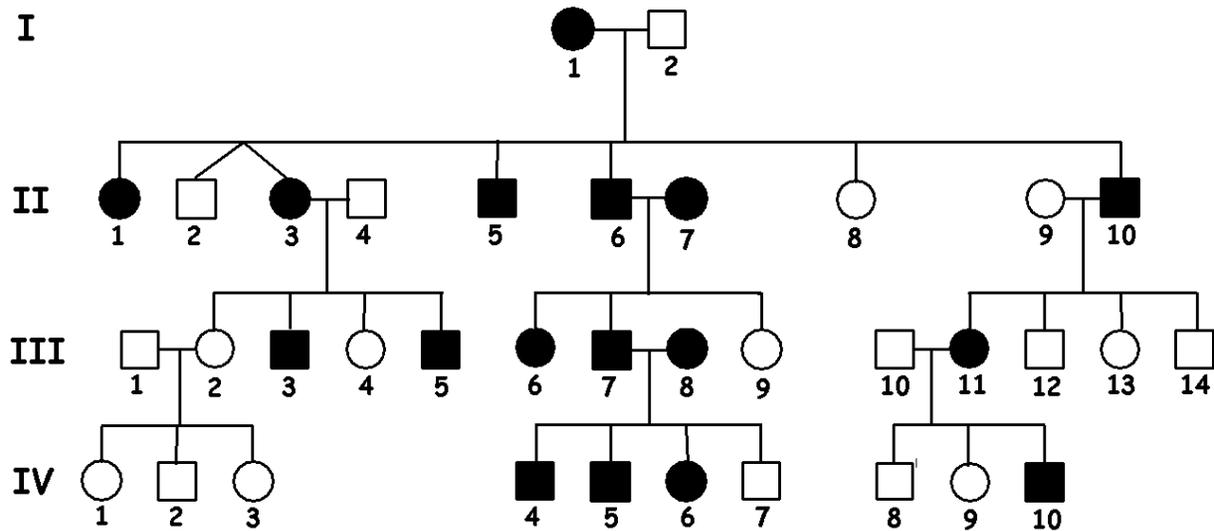
Individual	Genotype	Individual	Genotype
(a)		(f)	
(b)		(g)	
(c)		(h)	
(d)		(i)	
(e)			

4. The following pedigree traces a form of deafness in a family. This deafness is a recessive trait. Using the letters N for normal and n for deafness, provide the genotypes for the individual indicated in the chart that follows.



Individual	Genotype	Individual	Genotype
I 1		III 5	
II 2		III 9	
II 6		IV 4	
II 7		IV 12	

5. The pedigree below traces brachydactyly, a condition in which fingers are abnormally short, through several generations of a family. Those individuals afflicted with brachydactyly are shaded. Use this pedigree to answer the questions that follow.



- a. Examine the children produced by individuals 6 & 7 in Generation II. How do you explain the fact that 9 is not brachydactyly?

- b. Is brachydactyly a dominant or recessive disorder? _____

- c. What is the relationship between individuals 2 & 3 in Generation II?

6. Identify the inherited disorder described below.

- a. Recessively inherited disorder in which a defective protein causes the build up of chloride ions in cells, the osmotic uptake of water from the surrounding mucus, and results in a very thick, viscous mucus. This thick mucus accumulates in the pancreas, lungs, & digestive tract.

Disorder: _____

- b. Recessively inherited disorder where a missing enzyme results in the accumulation of lipids in the brain. The accumulation of lipids in the brain causes seizures, blindness, and degeneration of motor & mental performance.

Disorder: _____

- c. Recessively inherited disorder that results in a single amino acid substitution in hemoglobin. This substitution results in abnormally shaped hemoglobin molecules and as a result abnormally shaped red blood cells.

Disorder: _____

- d. This disorder is caused by a late-acting lethal dominant allele. The phenotype does not appear until 35 to 40 years of age and causes degeneration of the nervous system and eventually death.

Disorder: _____

7. Explain how a lethal recessive gene can be maintained in a population.
