NAME:

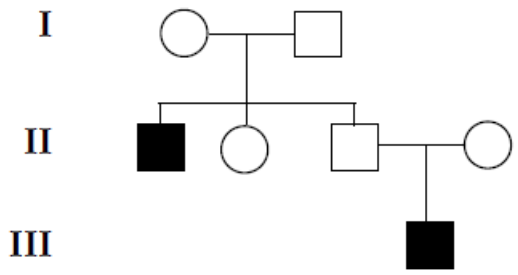
LABORATORY 10; EXERCISE 2. PEDIGREE ANALYSIS

Purpose – This Laboratory will be divided into three exercises. In the first exercise you will be asked to develop your own model Pedigrees for common Modes of Inheritance. In the second exercise you will use these models to help answer a set of questions. For the last exercise, you will act as a Genetic Counselor assigned to analyze a set of actual case studies.

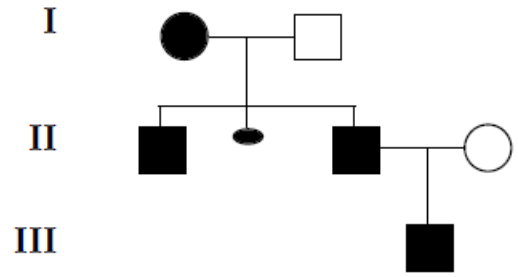
SPECIFIC LABORATORY PROTOCOL –

1. For each of the following Pedigrees identify the most probable Mode of Inheritance. If the data are consistent with more than one Mode list them all. Provide probable genotypes for all individuals.

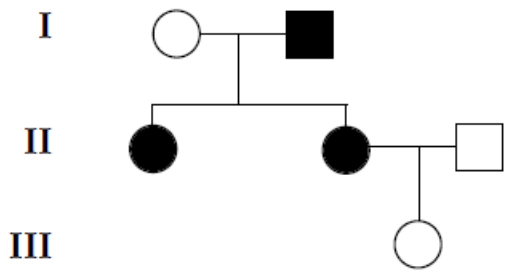
A.



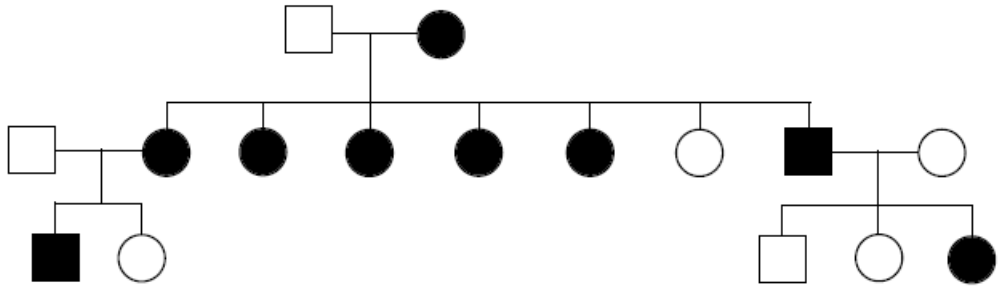
B.



C.



2. Examine the following Pedigree. For each of the Modes of Inheritance listed, state whether the inheritance pattern is consistent with that mode. If not, identify one or more specific matings that support your conclusion and explain why.



AUTOSOMAL RECESSIVE:

AUTOSOMAL DOMINANT:

SEX-LINKED RECESSIVE

SEX–LINKED DOMINANT

3. Sam has pink dimples, a dominant trait, that he inherited from his mother. Sam's maternal grandfather also has pink dimples but no one else in the family does. Sam marries Cassie. Cassie has no dimples neither does their first child, Samantha. Cassie would like to have a child with Sam's dimples. What is the probability that Cassie and Sam's next child will have pink dimples? Draw a Pedigree to support your answer.

4. **Hurler's Syndrome** is a genetic disease of humans that results from the buildup of mucopolysaccharides. The disease is caused by a defect in the IDUA gene located on Chromosome 4. Symptoms of Hurler's begin to develop in early childhood and eventually lead to death as a result of organ failure. You are a genetic counselor who is assigned a case involving Hurler's Syndrome. A phenotypically normal couple has requested a consultation because they have discovered that Hurler's is present in both of their families. The man reports that he had a female first cousin on his father's side with Hurler's. An older sister of the woman had Hurler's and her mother has reported that she had a younger brother that died from this disease. No other members of either family are reported to have had this Syndrome. Remember that most human genetic diseases are rare.

A. Based on the information provided, draw a Pedigree for these two families.

B. What Mode of Inheritance is most likely expressed by Hurler's Syndrome? What leads you to this conclusion?

C. What is that probability that both members of this couple are heterozygous carriers for Hurler's?