

Assignment #2: Genetics Pedigree Task

A pedigree is a chart of a person's ancestors that is used to analyze genetic inheritance of certain traits – especially diseases. The symbols used for a pedigree are:

- female, unaffected
- female, affected
- male, unaffected
- male, affected

Recap: Siblings are placed in birth order from left to right and are labeled with numbers.

- o Each generation is labeled with a Roman numeral.
- o Example: we would name an individual II-3 if he/she was in the second generation and the 3rd child born

NOTE: FOR THE PURPOSE OF THIS TASK, IT IS NOT SPECIFIED WHETHER AN INDIVIDUAL IS A HETEROZYGOUS (CARRIER) GENOTYPE. This means that unaffected individuals maybe either homozygous or heterozygous for the dominant trait!

- female, unaffected (could be homozygous/ heterozygous)
- male, unaffected (could be homozygous/ heterozygous)

TOTAL MARKS = _____ /33 (T/I)

You are welcome to complete this sheet on paper and then take a CLEAR photo of it to submit (it may be easier to draw punnet squares on paper question 1b)

QUESTIONS:

1) Assume the trait, attached ear lobes seen in affected individuals is recessive. Answer the questions below using the pedigree, Figure 1.

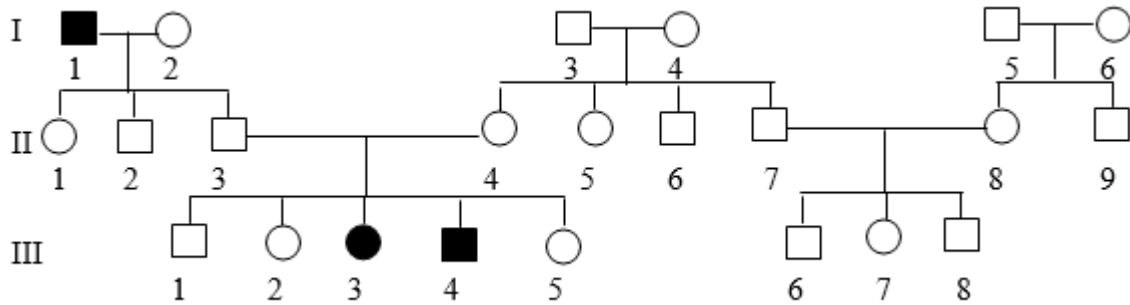


Figure 1

a) Dominant Allele : _____ Recessive Allele : _____ * use the letter E/e
(2)

b) Identify the genotypes of the following individuals using the pedigree, Figure 1. (Note: there may be more than one possible genotype; list all possible genotypes for each individual). Show your work, as to how you came up with these possibilities using Punnet square/s. You must have punnet squares to receive full marks.
(16)

• II-3: _____

Punnet Square/s:

• II-4: _____

Punnet Square/s:

• III-4: _____

Punnet Square/s:

• III-1: _____

Punnet Square/s:

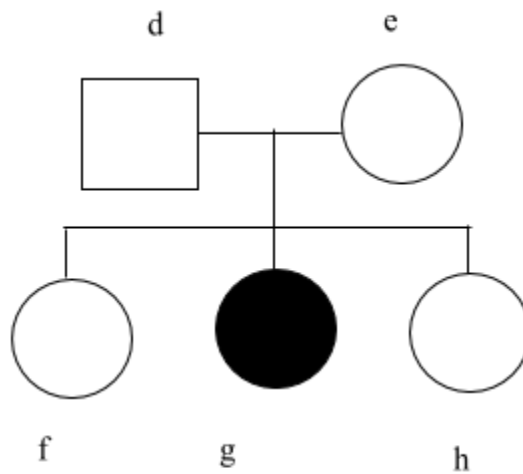
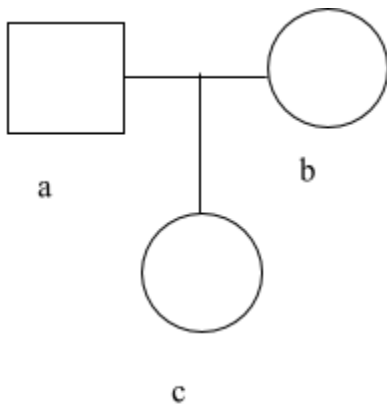
c) Why do we not see any instances of attached ear lobes in individuals (II 1, II 2, II3) who are children of parents I1 & I2. Explain your answer. (3)

d) Can individual II 1 have the genotype EE? Explain. (2)

e) "III 5 is older than III 3"- Is this statement true or false? Explain. (2)

2. Using the pedigrees below, predict the genotypes for these families. Assume that the affected individual's trait is recessive. (8)

* No need to show punnet squares



a)
b)
c)
d)
e)
f)
g)
h)

