Module 11: Mendelian Genetics

1. Define the Law of Segregation.
2. Define the Law of Independent Assortment. Does the inheritance of one trait affect another?
3. Explain the difference between homozygous dominant (AA), heterozygous (Aa), and homozygous recessive (aa).
4. If "A" = Tall and "a" = Short, what is the phenotype of "Aa"?
5. Differentiate between incomplete dominance and codominance.
6. Explain polygenic inheritance using human height or skin color as an example.
7. In peas, Purple flowers (P) are dominant to White flowers (p).
8. Perform a cross: Pp × Pp. What are the expected genotypic and phenotypic ratios?
9. Human blood type involves multiple alleles (I^A, I^B, i) and codominance.
10. Can a Type A mother and Type B father have a Type O child? Show the Punnett square.
11. Two unaffected parents have an affected child. Is the trait likely dominant or recessive?
12. Hydrangea flower color changes with soil pH. Does genotype always strictly determine phenotype? How does the environment modify gene expression?