

**MINISTRY OF EDUCATION, HERITAGE AND ARTS
YEAR 13 BIOLOGY
REVISION WORKSHEET 5**

Write the answers to the following questions in your exercise/activity books.

Genetic Engineering/Population Genetics

1. a. Define the term **recombinant DNA (rDNA)**. **(1 mark)**
 b. In 50-70 words, explain how recombinant DNA is formed. **(3 marks)**
 c. Explain the significance of DNA recombinant technology. **(3 marks)**
 d. Explain the economic implications and dangers of rDNA. **(3 marks)**

2. In 100 words, describe the benefits and drawbacks of genetically modified organisms. **(8 marks)**

3. a. State the Hardy Weinberg (HW) Principle. **(1 mark)**
 b. Explain why the HW Principle is not satisfied in natural populations. **(2 marks)**

Solve the following Hardy Weinberg problems. (2 marks each)

4. In a population that is in Hardy-Weinberg equilibrium, the frequency of the recessive homozygote genotype of a certain trait is 0.09. Calculate the percentage of individuals homozygous for the dominant allele.

5. In a population that is in Hardy-Weinberg equilibrium, 38 % of the individuals are recessive homozygotes for a certain trait. In a population of 14,500, calculate the percentage of homozygous dominant individuals and heterozygous individuals.

6. Allele T, for the ability to taste a particular chemical, is dominant over allele t, for the inability to taste the chemical. Four hundred university students were surveyed and 64 were found to be non-tasters. Calculate the percentage of heterozygous students. Assume that the population is in H-W equilibrium.

7. An allele W, for white wool, is dominant over allele w, for black wool. In a sample of 900 sheep, 891 are white and 9 are black. Calculate the allelic frequencies within this population, assuming that the population is in H-W equilibrium.

The End