Genomics Assignment- Adepeju Olowookere

# Part 1: Vocabulary Review (10 points)

Define the following terms in your own words (2–3 sentences each):

1. 1. Genome  
   A genome is the complete set of DNA in an organism, including all its genes. It contains the instructions the body needs to grow, function, and reproduce.
2. 2. Single Nucleotide Polymorphism (SNP)  
   An SNP is a small change in a single letter of the DNA sequence. These tiny differences make people unique and can sometimes affect health or how we respond to medicine.
3. 3. Bioinformatics  
   Bioinformatics is the use of computers to understand biology, especially large sets of genetic data. It helps scientists find patterns and make sense of complex information like DNA sequences.
4. 4. Central Dogma  
   The central dogma explains how genetic information flows: from DNA to RNA to proteins. It’s the basic way cells use genetic code to make things the body needs.
5. 5. Liquid Biopsy  
   A liquid biopsy is a test that looks for cancer or other diseases using a blood sample. It’s less invasive than traditional biopsies and helps track health changes over time.

# Part 2: Short Answer Questions (20 points)

Answer the following questions briefly (3–4 sentences each):

1. What is the difference between genetics and genomics?

Genetics looks at how traits are passed from parents to children by studying individual genes. Genomics looks at all the genes in an organism and how they work together. So, genetics is like reading one book, while genomics is like reading the whole library.

1. Why was the Human Genome Project a turning point in biology?  
   The Human Genome Project was a major step because it gave us the complete map of human DNA. It helped scientists understand diseases better and find new ways to treat them. It also opened the door to personalized medicine.
2. How does CRISPR help in plant genomics?

CRISPR is a tool that lets scientists edit plant genes easily. It helps improve crops by making them more resistant to disease or grow better. This can help farmers grow food more efficiently and with fewer chemicals.

4. What are the advantages of using AI in precision oncology?  
AI helps the healthcare providers analyze a lot of cancer data quickly to find the best treatment. It can spot patterns that humans might miss. This makes cancer care more personal and targeted for each patient.