
Human Genetics: Problem Set V

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Abstract

This work contains the solutions to the problem set V of Human Genetics 2015 course at New York University.

Question 1 .

Solution. It is known that

$$\begin{aligned}\text{The concentration of A} &= \text{The concentration of T} \\ \text{The concentration of G} &= \text{The concentration of C},\end{aligned}$$

and the above four bases are the only bases present. Consequently, as we have that the concentration of *A* is 19%, we have the following concentrations of each bases:

$$\begin{aligned}\text{The concentration of A} &= 19\% \\ \text{The concentration of T} &= 19\% \\ \text{The concentration of G} &= 31\% \\ \text{The concentration of C} &= 31\%.\end{aligned}$$

Question 2 .

Solution.

Question 3 .

Solution.

Question 4 .

Solution. (a) The figure 1 helix is right-handed, when the figure 2 helix is left-handed.

(b) The figure 2 helix has a major groove and a minor groove, when the figure 1 helix does not.

(c) Both figures have a proper combinatorial constraint with base-pairing. The figure 1 has purple-green, green-purple, red-blue, and blue-red base pairs. The figure 2 has red-green, green-red, blue-yellow, and yellow-blue base pairs.