Name _____ Biology 1102

Sec. # _____ DNA Technology and Forensics

1. Given the following partial DNA sequence: *(2 pts)*

   a) Write the complementary strand (3' to 5').

   5' CCCCGTACCGGCGATCGGGAATTCCCGGAGATCCGTATTAGCCCGC 3'

   3' _____ 5'

   b) If this piece of DNA is digested with the restriction enzyme Hae III, which cuts at the following sequence, how many RE sites are there? _____

   5' **CC** | **GG** 3'
   3' **GG** | **CC** 5'

   Indicate the location(s) of the restriction site(s) by drawing a straight line through the DNA to show how it will be cut into fragments.

   HINT: Remember to look for the sequence reading left to right (5' to 3') across the **top** strand and that the DNA will be cut through both the top and bottom strands.

   c) How many DNA fragments will result from this RE digest? _____

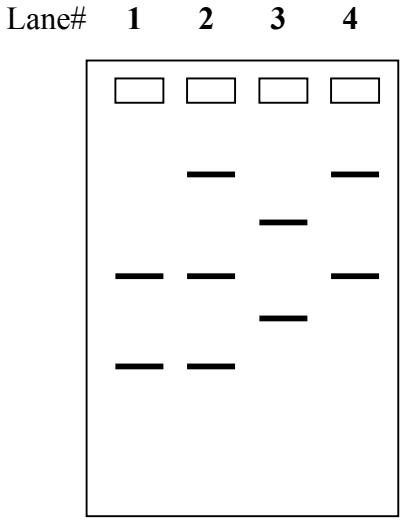
   d) What are the sizes in base pairs (bp) of **each** resulting fragment? _____

2. Examine the image of the gel below. This represents information for a paternity test. Assume that the DNA was cut with one restriction enzyme. Based on what you have learned about gel electrophoresis, who is the likely father of the child? *(1 pt)*

   Lane 1 = Mother's DNA
   Lane 2 = Infant's DNA
   Lane 3 = Boyfriend #1's DNA
   Lane 4 = Boyfriend #2's DNA

   Potential father is: _____

   Explain your reasoning:



3. Explain how DNA fragments are separated in gel electrophoresis. *(1 pt)*

4. Utilize the following skeletal data to determine the ethnic ancestry and height of the subject in question. Refer to your lab manual for formulas and tables, and show all calculations! *(1 pt)*

Sacral anterior width = 119 mm

Sacral anterior height = 130 mm

Oblique length of femur = 60 cm

Ethnicity = _____

Height = _____ feet, _____inches