Quiz 1 KEY
Restriction Enzymes & Plasmids
Bio 210A

Fill-in the blanks
1. Biotechnology is based on the use of ___Cells___ or ___parts___ of cells to produce useful products.
2. Plasmids are circular ___DNA___ found in ___most___ bacteria, fungi, and plant cells. They carry genetic information that is ___useful___ but not ___essential___.
3. Restriction enzymes are ___sequence specific endonucleases___ that are found in ___bacteria___ cells. Their natural function inside these cells is ___to cut foreign DNA of bacterial viruses to protect cells from being taken over and destroyed.___

Quiz 2 KEY
DNA Gel Electrophoresis
Bio 210A

Fill-in the blanks
1. DNA gel electrophoresis is a technique used in DNA Technology to separate DNA molecules according to their ___size___. In this technique, a gel made of ___agarose___ to which a DNA staining dye known as ___Ethidium Bromide___ is prepared.
2. Before the DNA samples can be loaded into the gel wells, a ___loading___ dye is added. That material contains two substances: ___glycerol___ to increase the density of the solution of the DNA sample, and a ___tracking___ dye to color the sample and to follow the progress of electrophoresis.
3. In addition to the readied DNA samples, a mixture of linear DNA fragments of known sizes known as ___DNA Ladder___ is loaded into a separate well to allow sizing of the DNA fragments in the analyzed sample.
4. The presence of the acidic ___phosphate___ group gives DNA a ___negative___ charge and as such DNA fragments would migrate through the gel pores from the direction of the ___negative___ electrode to the ___positive___ one.
5. At the end of the electrophoresis run, ___UV___ illumination is used to visualize the DNA bands on the gel.
Fill-in the blanks

1. The term PCR in DNA technology stands for the **Polymerase Chain Reaction**.
2. PCR is used to **amplify or clone in vitro** a specific DNA fragment from any complex genome.
3. Each cycle of PCR is made of **3** steps that start with **denaturation** of the genomic DNA, followed by **annealing** of the primers, and end with **extension** to form the complementary strand of DNA.
4. The specificity of the amplified fragment is determined by the sequence of the **oligonucleotide synthetic primers** used in the reaction.
5. The following are necessary components of each PCR reaction:
   a. Genomic DNA (source to be amplified)
   b. Forward primer
   c. Reverse Primer
   d. dNTPs (nucleotide mixture)
   e. DNA Taq Polymerase
   f. Buffer
   g. MgCl₂
6. The enzyme used for PCR is **thermostable** because it can tolerate high temperatures.
7. To prepare genomic DNA for PCR cells are **lysed** (broken-up) using a solution containing **detergent** and **protease**. Chelex beads were added to **adsorb Mg²⁺ released from lysed cells**.