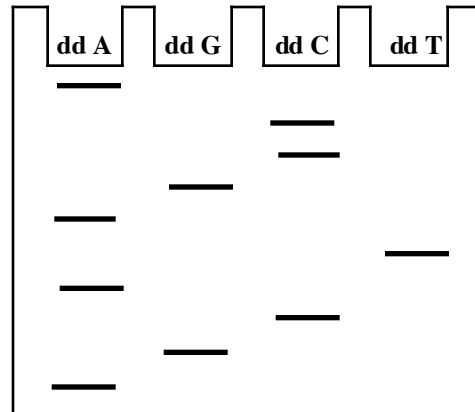


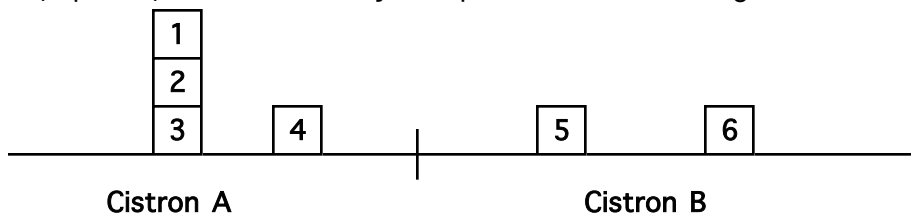
1. (2 points) Consider the diagram to the right to be an autoradiogram of dideoxy sequencing gel. To the right of the gel give the DNA nucleotide sequence



2. (4 points) The following table deals with the various mutations of the lac operon. Bacteria may be in a medium which either contains or does not contain lactose. These bacteria will either produce or not produce the enzyme beta galactosidase. Complete the following table by inserting the word present or absent relative to beta galactosidase.

Genotype	if lactose is absent, then beta-galactosidase is:	if lactose is present, then beta-galactosidase is:
$\frac{i^- \quad o^+ \quad z^+}{i^+ \quad o^+ \quad z^-}$		
$\frac{i^+ \quad o^c \quad z^-}{i^+ \quad o^+ \quad z^+}$		

3. (4 points) In a Benzer style map of mutations we might see the following diagram:



Complete the following table by indicating certain properties pairs of mutations when used in crosses.

Mutations	Show complementation? (yes or no)	Alleles or non-alleles?	Recombination between mutations? (yes or no)
1 and 2			
3 and 4			
4 and 5			