

Name \_\_\_\_\_

Section [ Circle One: (Mon Weds) (Tues Thurs) ]

Genetic Engineering - Exam 1a

10 points

Use the data below to construct a restriction map for an unknown plasmid. Indicate the intermediate maps and show your work for partial credit.

<i>EcoRI</i>	3.9	3.7			
<i>HindIII</i>	4.0	2.1	1.5		
<i>PstI</i>	4.0	3.6			
<i>EcoRI + HindIII</i>	2.7	2.1	1.3	1.2	0.3
<i>EcoRI + PstI</i>	3.3	3.0	0.7	0.6	
<i>HindIII + PstI</i>	2.1	1.9	1.7	1.5	0.4

Name \_\_\_\_\_

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Genetic Engineering - Exam 1

90 points

1. (10) Fill in the boxes:

<p>Make up a 6-base DNA sequence that would be typical of a type II restriction site. Be sure to show the 5' phosphate and 3'hydroxyl. <b>You may use no more than two bases repeated in tandem!</b></p>	
<p>Show how this site exhibits dyad symmetry both structurally and sequentially.</p>	
<p>Make up a sequence that would be compatible with your made-up sequence.</p>	
<p>Define an isoschizomer. Use your made-up sequence to demonstrate the difference between isoschizomeric enzymes.</p>	
<p>Use the nucleotide short-hand models to show the mechanism of cleavage</p>	

2. (20) Fill in the table below. Under restriction product, draw a schematic of DNA cut as indicated, showing the 3'OH and 5'P. For each enzyme, indicate whether or not it will work of the cut end by placing a "+" or a "-" in the box.

Cut to the:	left of axis	right of axis	on axis	
Restriction Product				For each enzyme give an example of why you might perform this kind of modification
S1 nuclease				
pol I				
BAP				
terminal deoxy-nucleotidyl transferase				

3. (10) Draw a general graph showing how molecular weight standards would be distributed through a gel. What regions of the gel would be most prone to inaccuracy and which least prone to errors. Why? How could you solve this problem?





9. (5) The molecular weight of Tris = 121.1, EDTA = 372.24, and Glucose = 180.16.

How would you make a stock solution of 2 M Tris and a stock solution of 0.4 M EDTA, 250 ml each?

Using the stocks, give the recipe for 100 ml of a solution that is 0.5 M Tris, 2 mM EDTA, 10% glucose.

10. (5) Draw a diagram showing how you would plate cells at a  $10^{-4}$  dilution. If you found 37 colonies at  $10^{-2}$  on MacConkey + Amp and 239 colonies at  $10^{-6}$  on LB, what would be the transformation frequency?

Extra Credit (5) Why is pUC9 a more appropriate control than pPL608 when you are running a gel to look for inserts in proximal and distal orientations?