NAME(s): _____   *Sec.* _____
Chem 227 / Dr. Rusay

Flatulence: *Part II*
Carbohydrates, Digestion & Enzymes

(**Clearly** answer the following questions and turn in. Can be done in partnerships of no larger than three members per group.)

1. Convert the *Glucometer Elite*™ data readings for split green peas to respective concentrations of glucose. Normalize the glucose data/concentrations of 0.25[So] and 0.50[So] to the [So]'s concentration/glucose data. Clearly graph glucose versus time for each of the trials on the same graph. Label each. Attach the graph.

Sugar Source	Temperature	Concentration [S]o	Reading Glucometer	Experimental Glucose	Normalized Glucose
	(oC)	time (min)	(mg/dL)	(mg/dL)	(mg/dL)
Split Green Peas		[S]o			
	25	5	110		
		15	402		
		25	526		
		35	582		
		45	574		
	25	0.25[S]o			
		10	68		
		20	131		
		30	151		
		40	149		
	35	0.5[S]o			
		3	83		
		18	345		
		28	370		
		41	363		
		63	360		

2. The *Glucometer Elite*™ measures the concentration of only the β-anomer of D-glucose. A computer chip processes the input to determine the overall concentration of glucose. The calibration curve that was produced used glucose solutions that were prepared 12h before analysis. Draw Haworth structures for the α-anomer and β-anomer of D-glucose.

D-glucose (α-anomer)	D-glucose (β-anomer)

3. Explain how mutarotation of the α-anomer and β-anomer of D-glucose and K_{eq} need to be considered in programming and building the computer (logic) chip in the *Glucometer Elite*™.

4. Do you think that *Beano* is just as effective *in vivo* as in these tests? Explain within the context of stomach acidity and oral administration.

5. What volume of gas could gastrointestinal bacteria theoretically produce from complete fermentation of 100g of red beans that were eaten by Dr. R. in his favorite BCR Los Panchos' burrito? Clearly state your assumptions and show your calculation. (A review of General Chem gas laws would be a good place to begin. You can assume that Los Pancho's would produce nothing less than "ideal" gases. Attach your calculations.)

6. Certain animals obtain food energy and fiber from the digestion of cellulose (tree bark). We cannot. If *Beano* were added to tree bark, could this combination be included as a healthy menu item in DVC's cafeteria? Briefly explain your answer.

7. Refer to the graph below. Would *Beano* work if added to foods before cooking? Estimate the optimum temperature for *Beano* performance. Explain your answers.

Temperature Effects