Comparison of Substitution and Elimination Reactions ***Datasheet***

Name: _____ Lab Section: _____

Bench and Group #: _____

1. **Fill in the table below with information about the starting materials used in the reaction (8 points).**

Draw the structure of the alkyl bromide you used.	Identify the alkyl bromide as primary, secondary or tertiary.
Draw the structure of the alkoxide you used.	Do you expect this alkoxide to behave as a base, a nucleophile or both?

2. **Fill in the table below with information about the expected SN_2 and E_2 products of the reaction (8 points).**

Draw the structure of the expected SN_2 product(s) that could form in this reaction. Provide a name to the expected product(s).	Draw the structure of the expected E_2 product(s) that could form in this reaction. Provide a name for the expected product(s).

3. **Fill in the results of the GC and mass spectral data for the reaction in the table below (15 points)**

GC Peak #	MW of Compound Corresponding to peak	Name of Compound Corresponding to peak	% of Reaction Mixture
Peak 1			
Peak 2			
Peak 3			
Peak 4			
Peak 5			
What is percent of the reaction that gives an SN_2 product?			
What is percent of the reaction that gives an E_2 product(s)?			

4. Fill in the table below with the results of your chemical tests. Provide observations for each test that helps you determine whether it was positive or negative (20 points).

Compound	NaI Test	Result (+ or -)	Observations
Alkyl Bromide:			
Alkene:			
Alkene:			
Reaction Mixture			
Compound	**$AgNO_3$ Test**	**Result (+ or -)**	**Observations**
Alkyl Bromide:			
Alkene:			
Alkene:			
Reaction Mixture			
Compound	**$KMnO_4$ Test**	**Result (+ or -)**	**Observations**
Alkyl Bromide:			
Alkene:			
Alkene:			
Reaction Mixture			
Compound	**Br_2 Test**	**Result (+ or -)**	**Observations**
Alkyl Bromide:			
Alkene:			
Alkene:			
Reaction Mixture			

Based on the results of the *chemical tests ONLY*, identify which compounds are present in the reaction mixture.

5. Are the results from the GC-MS data consistent with the chemical test results? *Explain* your answer (10 points).

6. Using your data, along with data from the rest of the class identify the favored mechanism for each reaction (SN_2, E_2 or both) (14 points).

Alkyl Bromide	Substitution of Alkyl Bromide (1°, 2°, 3°)	Major Reaction(Product(s) (SN_2, E_2 or Both)		
		Methoxide	Ethoxide	tert-Butoxide
1-bromopentane				
2-bromopentane				
2-bromo-2-methylpentane				

Are the results from these reactions consistent with what you would expect based on a theoretical understanding of SN2 and E2 mechanisms? Explain your answer.