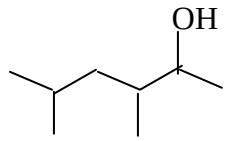
*II-1c ____C ____NC
**II-3b ____C ____NC

Chemistry 251
Worksheet 4

Name: _____

A. (2.0 pts.) Give an acceptable name or formula for each of the following.

1. $(CH_3)_2CHCH_2CH_2CH_2CH_2OH$.

2. 

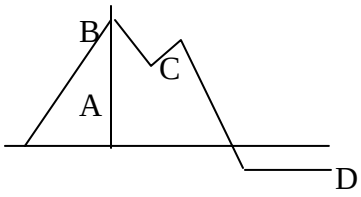
3. 3-methyl-1-butanol.

4. 3,3-dimethylpentyl alcohol.

B. (1.0 pts.) Given the following pK_a values, list the acids in order of increasing acid strength.

pK_a of CH_3COOH = 4.74; pK_a of HF = 3.5; pK_a of CH_3OH = 16

C. Match each labeled point of the energy diagram with the appropriate description.



____ Heat of reaction.
____ Intermediate.
____ Transition state.
____ Energy of activation.

D. (1.0 pts.) Arrange the following compounds in order of their reactivity toward S_N1 reactions.

2-methyl-2-butanol; 1-butanol; 2-butanol.

E. (1.0 pts.) For each of the following compounds, give the carbonation that would be expected to form initially in an S_N1 reaction.

1. 2-methyl-2-hexanol.

2. 2-propanol.

F. (2.0pts.) For each of the following reactions, predict the product(s) expected , predict the mechanism, and write the mechanism for the reaction. Be sure to us curved arrows to show the flow of electrons.

**1. 3-methyl-3-pentanol + HBr $\rightarrow$

2. 1-butanol + HCl $\rightarrow$

G. (1.0 pts.) Predict the product(s) expected for each of the following reactions.

*1. 2-pentanol + PBr_3 $\rightarrow$

2. 2-methyl-2-hexanol + H_2SO_4/NaBr $\rightarrow$

H. (1.0 bonus pts.) The following reaction proceeds using an S_N1 mechanism. Write the mechanism for this reaction, draw the energy diagram for the mechanism and label all the peaks and valleys.