*IV-1 ____C ____NC
**IV-2 ____C ____NC

Chemistry 251
Worksheet 11

Name: _____

A. (2.0 pts.) Indicate the number of signals expected in the proton NMR spectrum of each of the following compounds.

1. trans-2-butane

2. 2-chloropentane

3. cis-1,3-dichlorocyclobutane

4. 3,3-dimethyl-1-butene

B. (2.0 pts.) For each of the following sets of data, assign a structure for the molecule consistent with the data. Give assignments for the signals in the spectrum.

Molecule	Proton NMR spectrum		
1. $C_5H_8Br_4$	singlet	3.6ppm	8H
2. $C_4H_8O_2$	triplet	1.2ppm	3H
	singlet	2.1ppm	3H
	quartet	4.1ppm	2H

*C. (2.0 pts.) Sketch the proton NMR spectrum expected for the molecule CH_3CHCl_2.

D. (2.0 pts.) Using the following ^{13}C-NMR and ^{1}H-NMR spectral data, give the structure of the compound and assign the NMR peaks in both spectra.

	^{13}C-NMR		^{1}H-NMR		
	^{13}C	Dept			
$C_5H_{10}O_2$	177.48	---	doublet	1.5ppm	6H
	51.50	CH_3	multiplet	2.3ppm	1H
	33.94	CH	singlet	3.1ppm	3H
	19.01	CH_3			

**E. (2.0 pts.) Using the attached IR and NMR spectra, give the structure of the compound and assign the NMR peaks and major IR peaks.

Bonus (1.0 pts.) From the following compounds, select the most likely compound that would give the major IR peaks listed.

___1. broad, strong peak at 3100cm^{-1}
broad, strong peak at 1710cm^{-1}

___2. weak, sharp peak at 3400cm^{-1}
broad, strong peak at 2900cm^{-1}

___3. broad, strong peak at 3300cm^{-1}
broad, strong peak at 2800cm^{-1}
weak, sharp peak at 1375cm^{-1}

___4. broad, strong peak at 2850cm^{-1}
sharp, strong peak at 1120cm^{-1}

A. $(CH_3)_2CHCH_2OH$

B. $CH_3CH_2\text{-}O\text{-}CH_3$

C. $(CH_3CH_2)_2NH$

D. $CH_3CH_2\overset{\overset{O}{\|}}{C}CH_2CH_3$