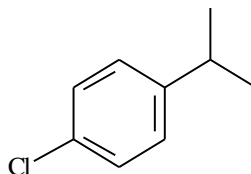
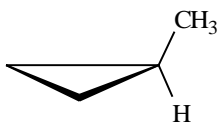
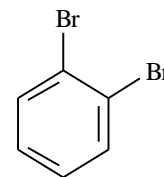
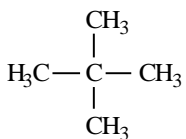
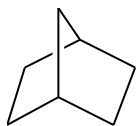
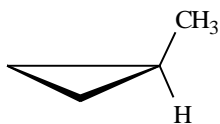
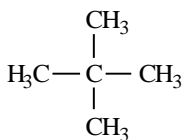
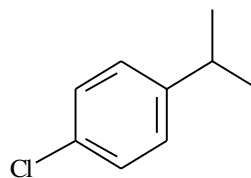
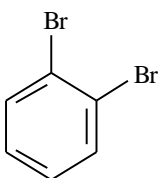


Exam 01 – Review Sheet (Ch. 13-15)

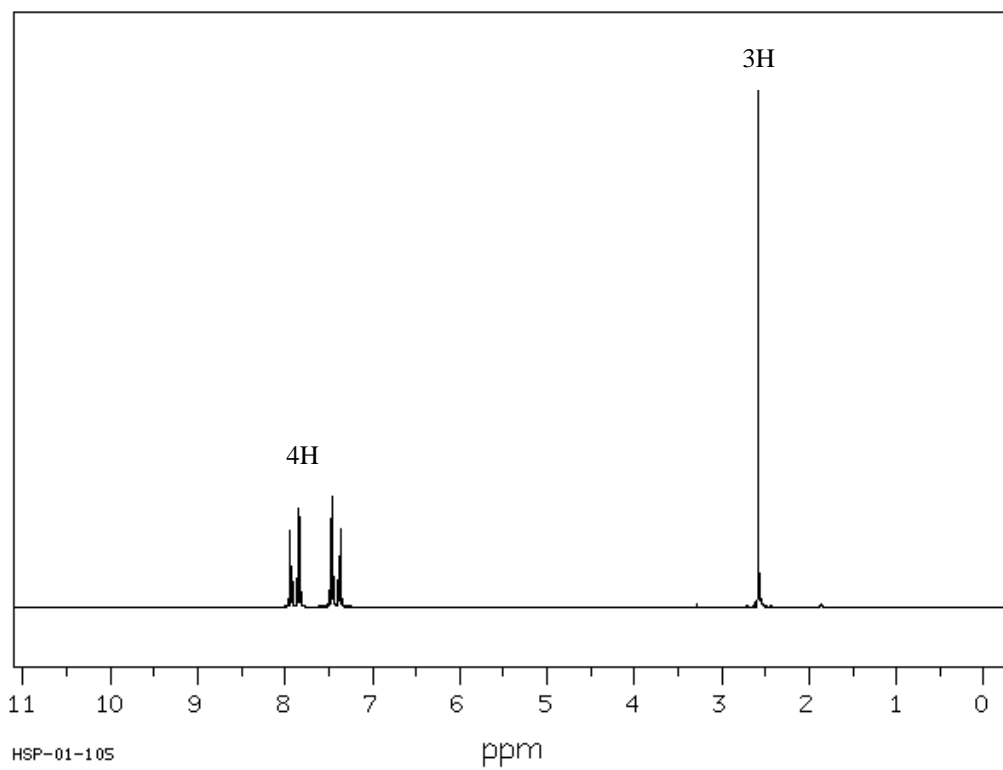
1. For each of the compounds below tell how many signals you would expect the molecule to have in its normal, broadband decoupled ^{13}C NMR spectra. Please assign the numbers for each type of carbon on the figures.



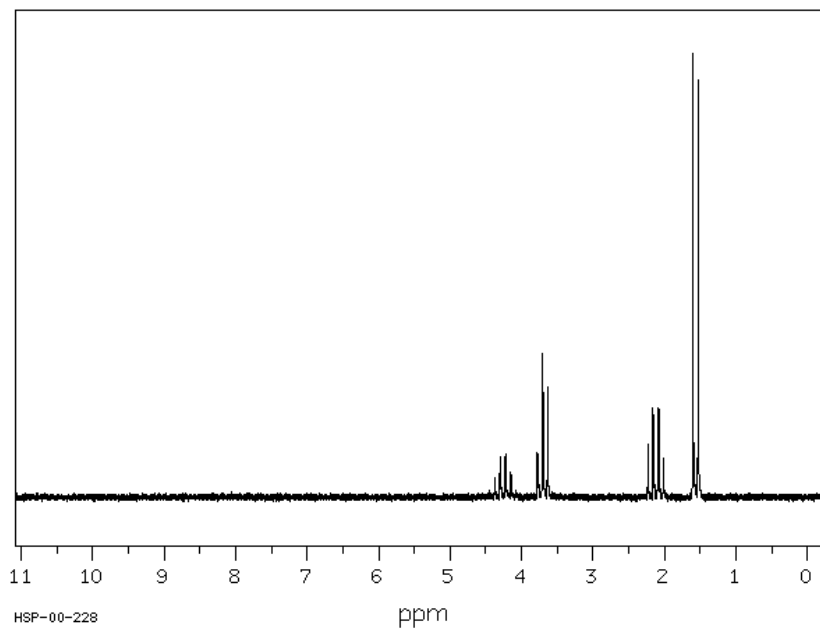
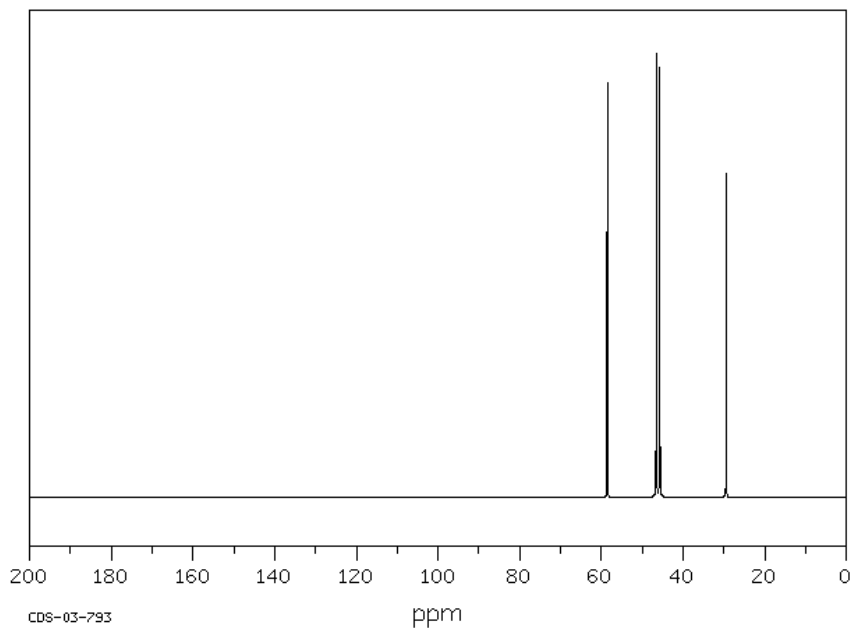
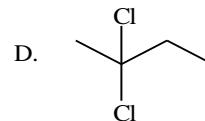
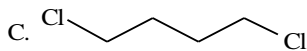
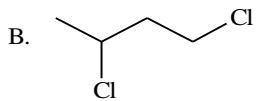
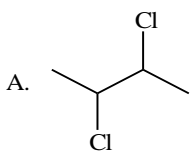
2. For each of the compounds below tell how many signals you would expect the molecule to have in its ^1H NMR spectra. Please assign the numbers for each type of H on the figures and indicate splitting pattern of each type of H (i.e. singlet, doublet, triplet).



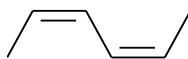
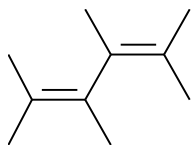
3. The molecular formula of a compound is C_8H_7ClO . Assign the structure of this compound using the 1H NMR spectrum below.



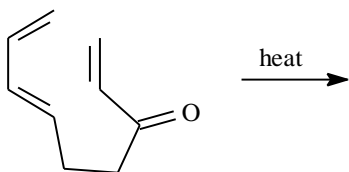
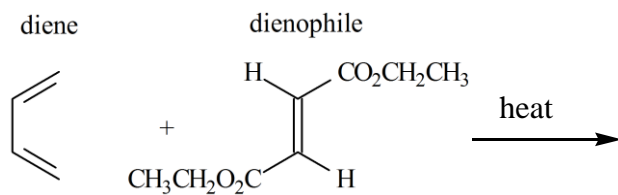
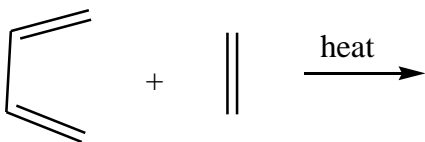
4. Which structure of molecular formula $C_4H_8Cl_2$ fits both the 1H NMR and ^{13}C NMR spectra shown below? Show your explanations.



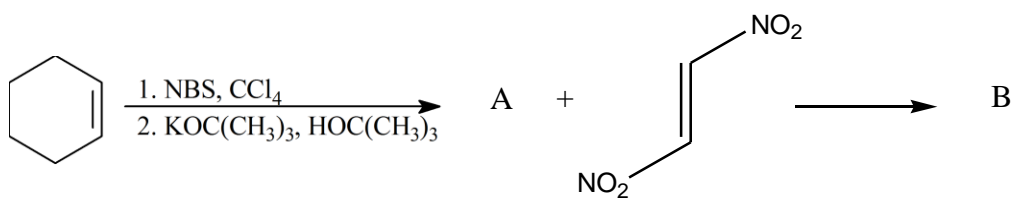
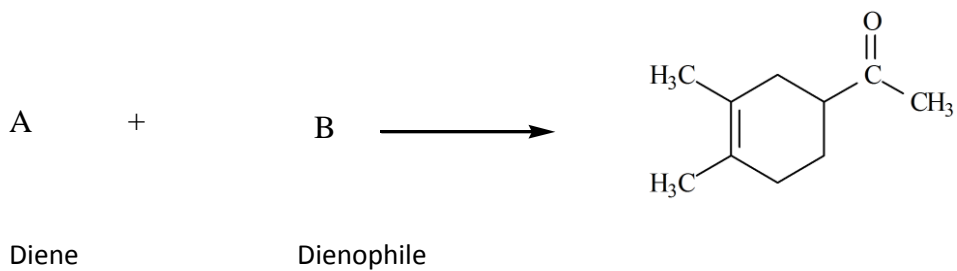
5. Give IUPAC names for the following alkenes including E & Z notations.



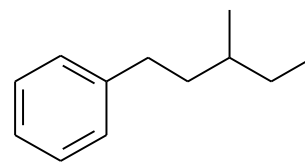
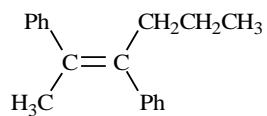
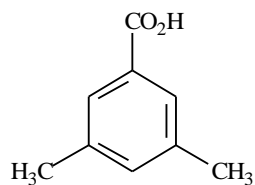
6. Draw the structures of the products of the following Diels-Alder reactions.



7. What are the structures of A and B in the following reactions:



8. Give the IUPAC name of the following compounds



9. Draw the structures of:

a) *o*-chlorophenol

b) *m*-fluoronitrobenzene

c) *p*-bromoaniline.

10. Conjugate bases **QB** and **ZB** are both resonance stabilized. Draw the indicated number of resonance for **QB** and **ZB**. Is **QB** aromatic?

