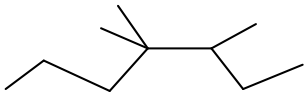
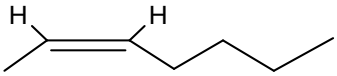
Chemistry 2203/7 Answers 2nd Sample TEST 1A Name: _ABENOR _____ Page1/1

Marks are in parentheses

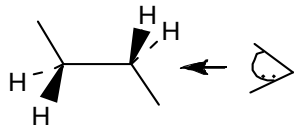
1. (6) For the molecules below, provide a systematic name (*2 x 2 marks*) and calculate the degrees of unsaturation (*2marks*). (Show calculation). Indicate stereochemistry of the molecule where appropriate.

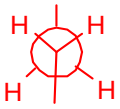




3,4,4-trimethylheptane Deg of unsat = (22-22)/2 = 0 *(Z)-2-heptene Deg of unsat =(16-14)/2=1*

2a. (2) Draw the Newman projection of *anti*-butane in 3D-perspective.

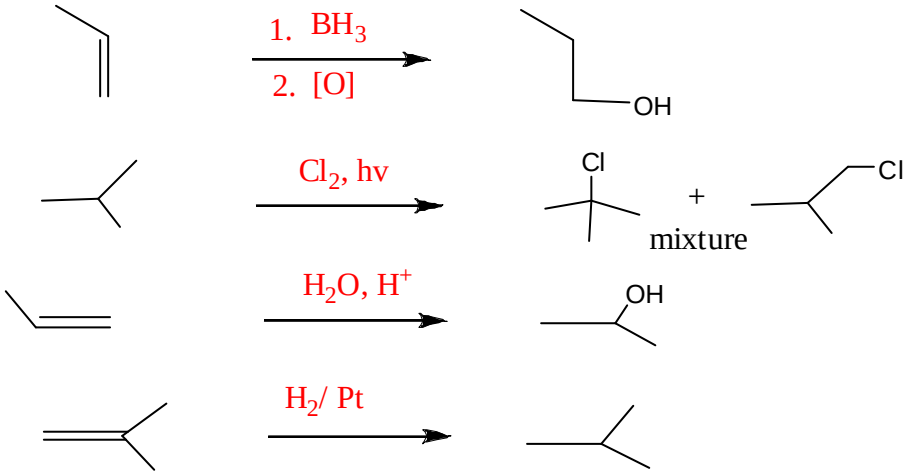




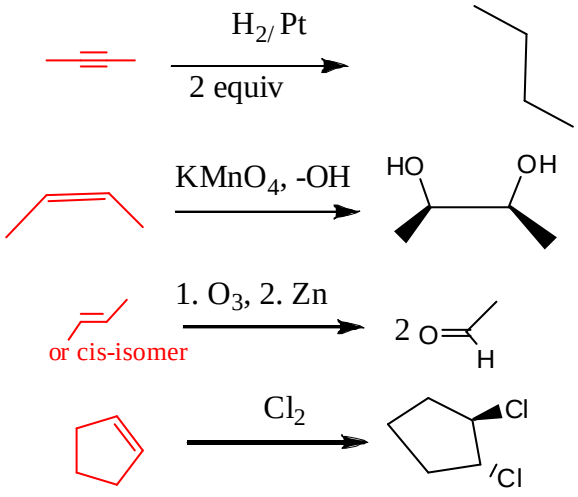
2b. (2) Highly symmetrical molecules have higher melting pts than unsymmetrical molecules. Why?

Symmetrical molecules stack better and more energy is required to disrupt the organized packing found in solids.

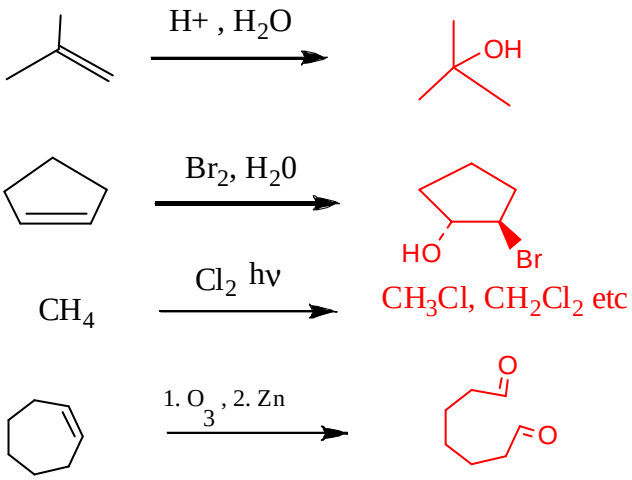
3a. (8) Show the **reagents** required to execute the reactions shown below.



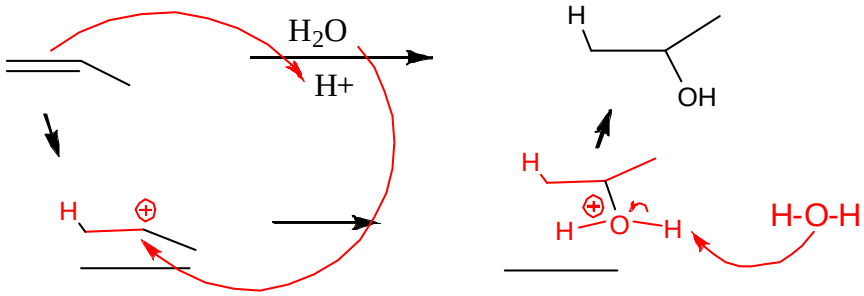
3b. (8) Show the **starting material** required to yield the product shown below.



3c. (8) Show the expected **product(s)** for each of the reactions shown below.



4a. (6) **MECHANISM**. Draw a mechanism for the following reaction, showing all intermediate species (*2 mark*), all curly arrows describing electron movement (*2marks*) and all charges (*2 mark*) (if applicable).



4b. (4) Give an appropriate example to illustrate the following:
Reductant H_2

Carbocation $CH_3\text{-}\overset{+}{C}H\text{-}CH_3$

Electronegativity propensity of an atom (A) or (B) to attract electrons to itself in an A-B bond..

Bronsted acid HCl

5. (6) **DEDUCTION**. The darkling beetle secretes defence weapons dissolved in a hydrocarbon **A .**
Compound **A** has a molecular formula $C_{15}H_{30}$.
Calculate the degree of unsaturation of Compound **A :** [*32-30*] /2 = 1

When Compound **A** is treated with permanganate in acid (H+), carbon dioxide is produced along with a linear, unbranched monocarboxylic acid, **B.** Catalytic Hydrogenation of **A** consumes 1 equivalent of H_2 to give **C.**
What is the structure of **A , B, C** and show the reactions leading to formation of **B** and **C** from **A**.

$CH_3(CH_2)_{12}CH_2\text{-}CH_3$ <- $CH_3(CH_2)_{12}CH{=}CH_2$ -> $CH_3(CH_2)_{12}C(OH){=}O$ + $O{=}C{=}O$

C H_2/Pt **A** $KMnO_4$/H+ **B**