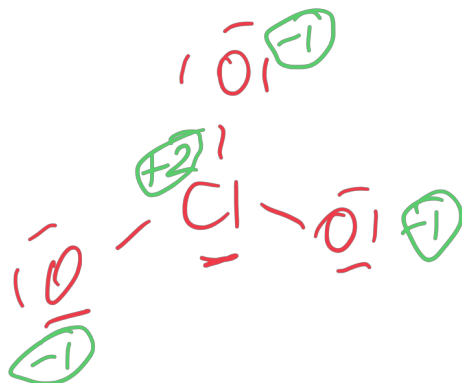


20 pts 1) Draw Lewis structures for the following. Be sure to indicate formal charges on each atom.

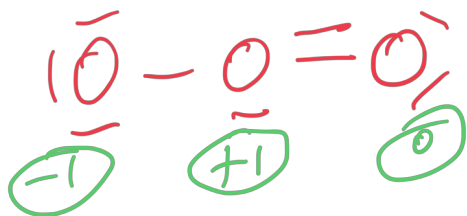
a) chlorate ion ClO_3^{1-}

$$\begin{array}{r} \text{need } 4 \times 8 = 32 \\ \text{have } \begin{array}{l} \text{Cl} \quad \text{O} \quad \text{charge} \\ 1 \times 7 + 3 \times 6 + 1 = 26 \\ \hline 6 \\ 3 \text{ bonds} \end{array} \end{array}$$



b) ozone O_3

$$\begin{array}{r} \text{need } 3 \times 8 = 24 \\ \text{have } 3 \times 6 = 18 \\ \hline 6 \text{ bonds} \end{array}$$



20pts 2) How many rings + multiple bonds must be present in:

$$2 \times 8 + 2 = 18$$

a) C_8H_{16}

down 2

1

$$2 \times 6 + 2 = 14$$

b) $C_6H_{12}O_3$

down 2

1

$$2 \times 12 + 2 = 26$$

c) $C_{12}H_{18}$

down 8

4

$$2 \times 8 + 2 = 18$$

d) $C_8H_{10}BrClO_2$

down 6

3

$$2 \times 12 + 2 = 26$$

e) $C_{12}H_{16}Br_2Cl_2$

down 6

3

20pts 3) Draw structures for:

a) an alkene with formula C_6H_{10}



b) an ether



c) an aromatic amine

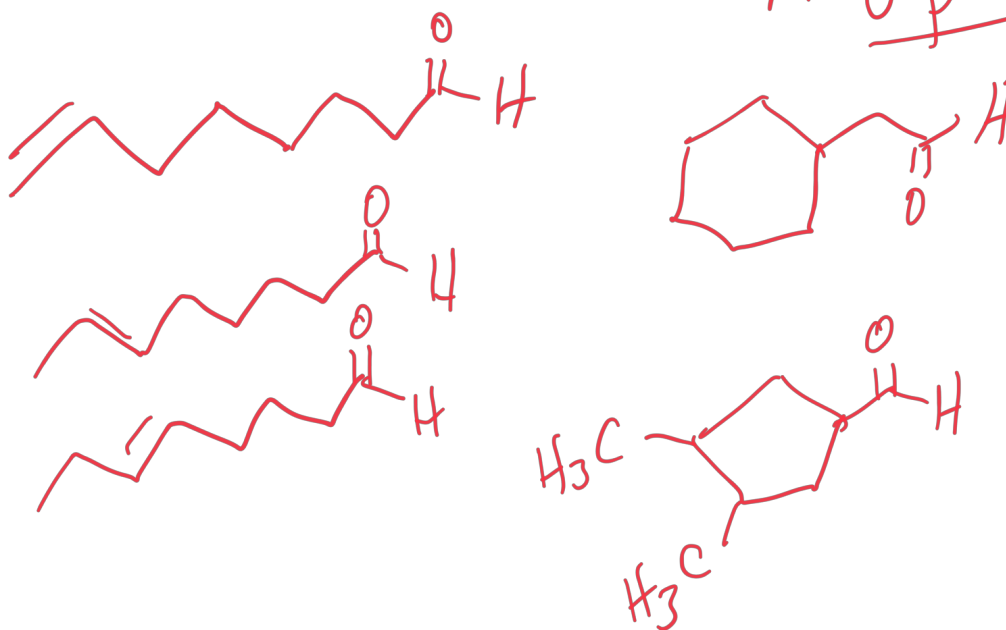


d) an alcohol

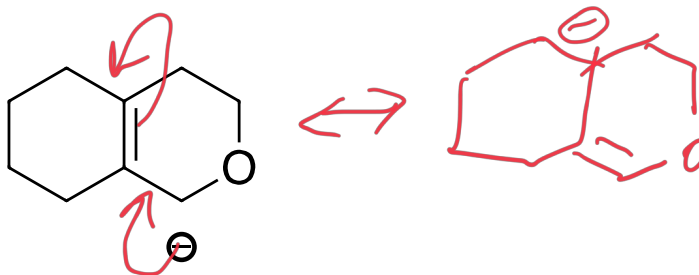


e) two isomeric aldehydes of formula C₈H₁₄O

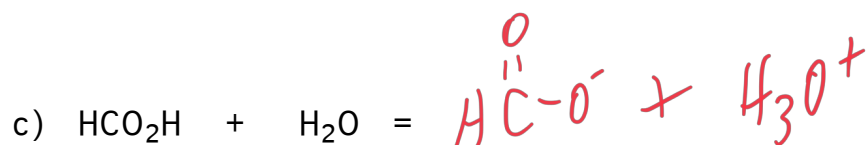
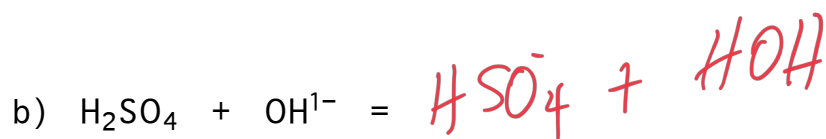
many possibilities



- 10pts4) Draw a resonance form for the ion below (use arrows to show the movement of electrons resulting in the resonance form):



- 20pts5) Complete the following acid base reactions:



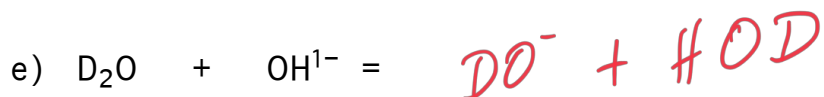
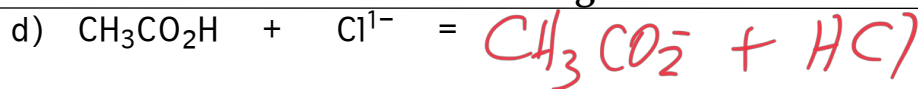
CHM 3342

Exam 1

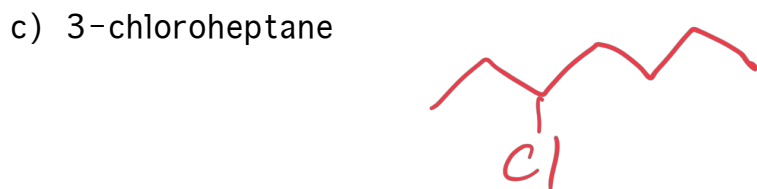
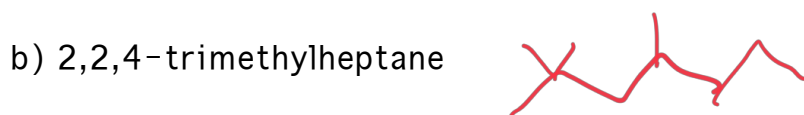
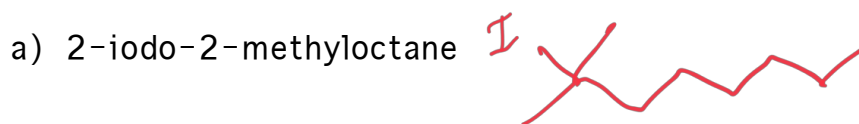
TUD Department of Chemistry
Spring 2019

200 points total

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20pts6) Draw structures of the following:



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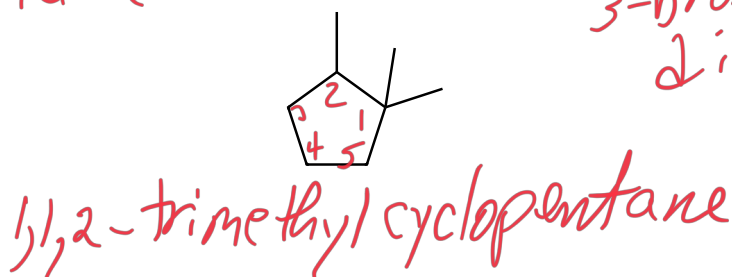
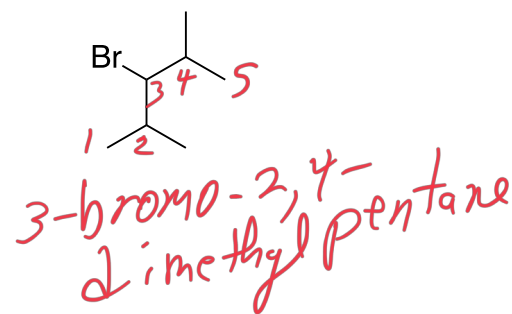
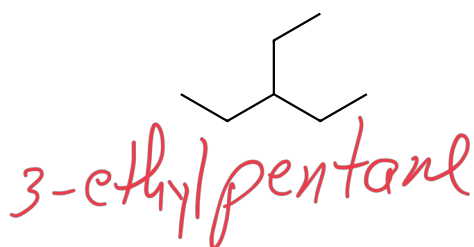
Exam 1

TUD Department of Chemistry
Spring 2019

200 points total

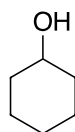
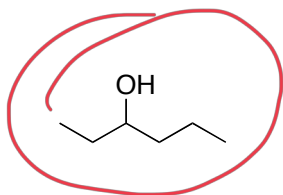
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20pts 7) Name these compounds

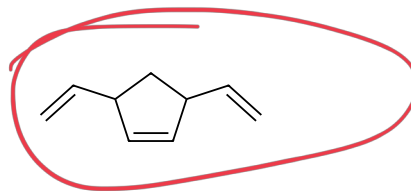
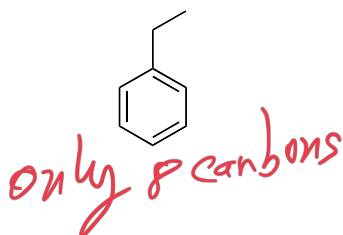


30pts 8) Circle the compound on the right which matches the molecular formula on the left:

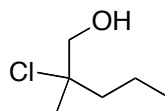
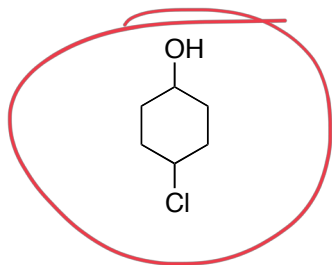
$C_6H_{14}O$



C_9H_{12}



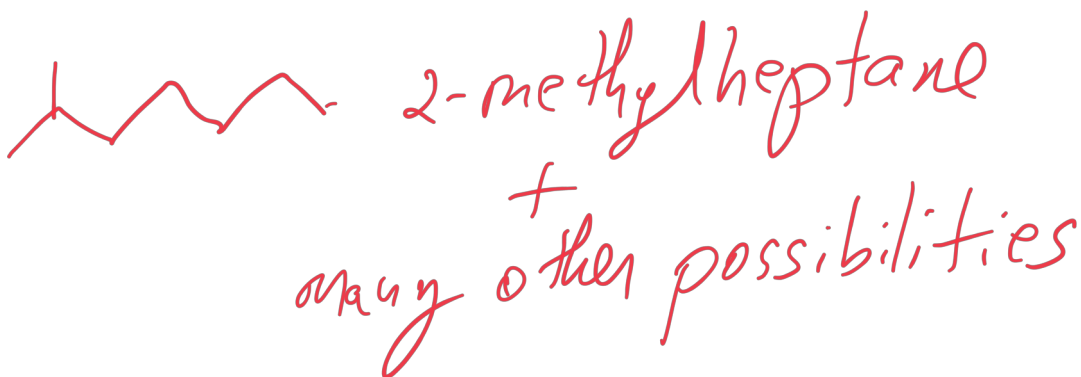
$C_6H_{11}OCl$



200 points total

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25pts9) a) Draw and give proper IUPAC names for two isomers of C_8H_{18}



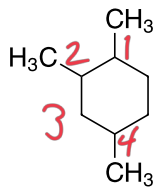
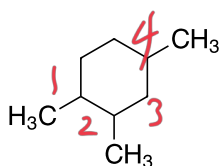
b) Draw and give proper IUPAC names for two isomers of C_6H_{12}



200 points total

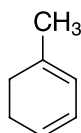
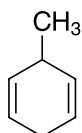
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30pts 10) a) State the relationship between each pair of molecules (possibilities are: same compound, stereoisomers, constitutional isomers, different compounds):

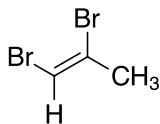
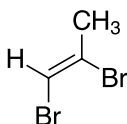


*both are 1,2,4-trimethyl
cyclohexane*

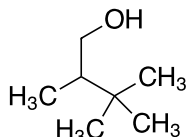
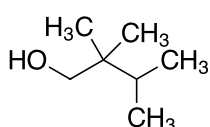
same



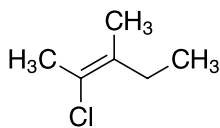
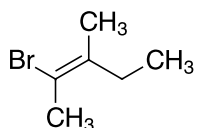
*structural
isomers*



same



*structural
isomers*



Different