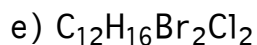
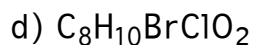
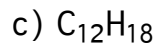
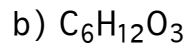
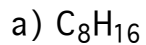


20 pts 1) Draw Lewis structures for the following. Be sure to indicate formal charges on each atom.

a) chlorate ion ClO_3^{1-}

b) ozone O_3

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



20pts 3) Draw structures for:

a) an alkene with formula C_6H_{10}

b) an ether

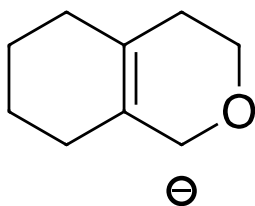
3 Cont'd)

c) an aromatic amine

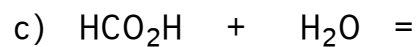
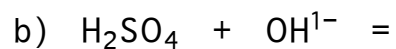
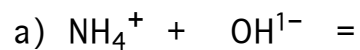
d) an alcohol

e) two isomeric aldehydes of formula $C_8H_{14}O$

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

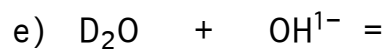
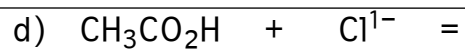


- 20pts5) Complete the following acid base reactions:



200 points total

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20pts6) Draw structures of the following:

a) 2-iodo-2-methyloctane

b) 2,2,4-trimethylheptane

c) 3-chloroheptane

d) 1-butyl-3-methylcyclopentane

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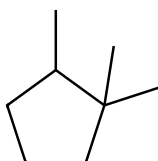
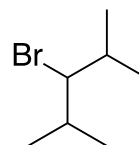
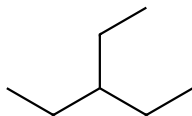
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200 points total

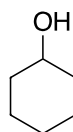
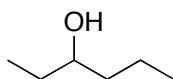
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20pts 7) Name these compounds

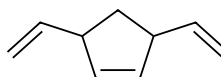
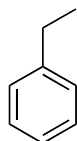


30pts 8) Circle the compound on the right which matches the molecular formula on the left:

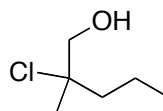
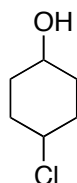
$C_6H_{14}O$



C_9H_{12}



$C_6H_{11}OCl$



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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):

