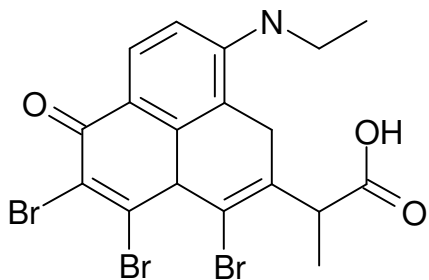


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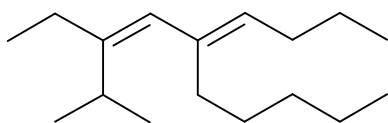
Organic Chemistry Test #1 - Structures and Nomenclature

1. For each of the following structures determine the degree of unsaturation and use this information to determine the complete chemical formula. Please note that the saturation formula is given in the next question.



$$\text{deg. unsat} = 7 + 3 = 10$$

$$\text{formula} = \text{C}_{18}\text{H}_{16}\text{NO}_3\text{Br}_3$$



$$\text{deg. unsat} = 2$$


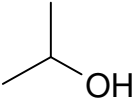
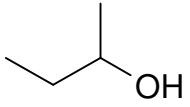
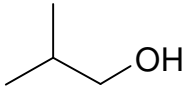
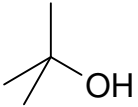
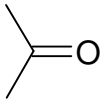
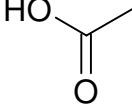
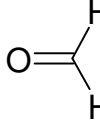

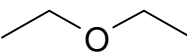
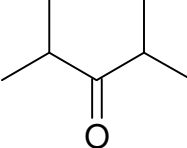
$$\text{formula} = \text{C}_{17}\text{H}_{32}$$

2.
$$\text{H} = [2\text{C} + 2] + 2(\text{deg. unsat}) - \text{X} + \text{N}$$

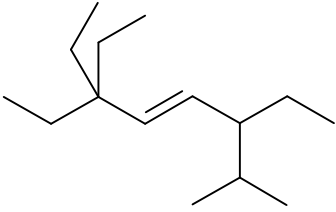
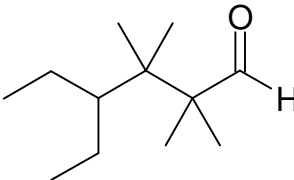
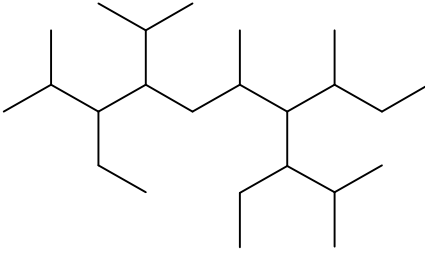
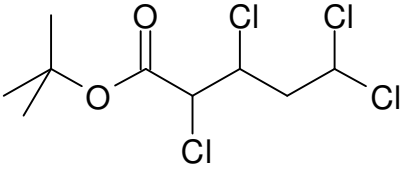
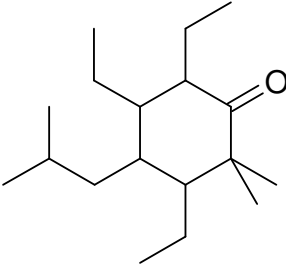
Use the above saturation formula to determine the degree of unsaturation and hence the possible combinations of functional groups (and rings) that would make possible each formula. (1/2 mark per correct response, some marks may be deduced for extra incorrect marks)

C_5H_{12} alkane	$\text{C}_6\text{H}_{15}\text{N}$ amine
C_6H_{12} alkene, ring	
$\text{C}_6\text{H}_{12}\text{O}$	aldehyde, ketone, alcohol alkene, alcohol ring ether alkene, ether ring

3. Provide common names and I.U.P.A.C. names for each of the following. If more than one common name exists, include both. Be sure to follow the rules when writing I.U.P.A.C. names. One mark per name

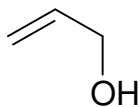
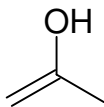
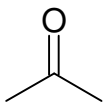
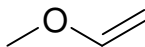
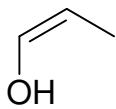
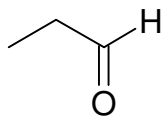
	Common Names	I.U.P.A.C.
	methyl alcohol	1-methanol
	isopropyl alcohol	2-propanol
	secbutyl alcohol	2-butanol
	isobutyl alcohol	2-methyl-1-propanol
	t-butyl alcohol	2-methyl-2-propanol
	dimethyl ketone acetone	2-propanone
	acetic acid	ethanoic acid
	formaldehyde	methanal
	acetylene	1-ethyne
	diethyl ether ether	
	diisopropyl ketone	2,4-dimethyl-3-pentanone

4. Write complete I.U.P.A.C. names for each of the following:

	<p>(E)-3,6,6-Triethyl-2-methyl-oct-4-ene</p> <p>3,6,6-triethyl-2-methyl-4-octene</p>
	<p>4-Ethyl-2,2,3,3-tetramethyl-hexanal</p> <p>4-ethyl-2,2,3,3-tetramethylhexanal</p>
	<p>4-sec-Butyl-3,8-diethyl-7-isopropyl-2,5,9-trimethyl-decane</p> <p>3,8-diethyl-7-isopropyl-2,5,9-trimethyl-4-secbutyldecane</p>
	<p>2,3,5,5-Tetrachloro-pentanoic acid tert-butyl ester</p> <p>t-butyl 2,3,5,5-tetrachloropentanoate</p>
	<p>3,5,6-Triethyl-4-isobutyl-2,2-dimethyl-cyclohexanone</p> <p>3,5,6-triethyl-4-isobutyl-2,2-dimethyl-1-cyclohexanone</p>

5. For each of the following chemical formula write structures for all possible structural isomers. If more than one of the same structure is drawn, no marks will be given for either structure. It may be useful to determine the combination of functional groups etc that could be used before you start. (See question #2 for saturation formula) Use only five and six memberer rings.
-

a) C_3H_6O



b) $C_5H_{11}Br$

