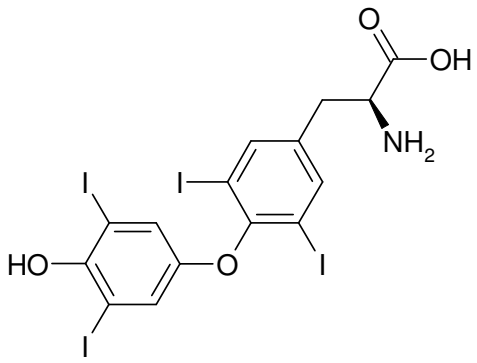
Name:_____

SCH 4U Organic Test – Part 1

1. State the degrees unsaturation and the chemical formula for thyroxine (thyroid hormone responsible for metabolic rate control)



(S)-2-Amino-3-[4-(4-hydroxy-3,5-diiodo-phenoxy)-3,5-diiodo-phenyl]-propionic acid

degree unsaturation

9 degree unsat.

chemical formula:

$C_{15}H_{11}NO_4I_4$

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

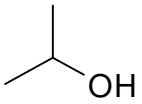
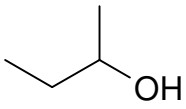
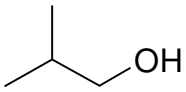
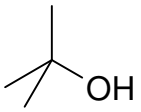
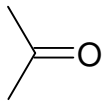
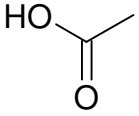
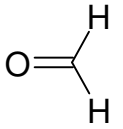
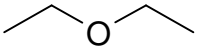
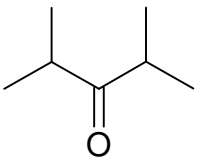
Use the above saturation formula to determine the degree of unsaturation and hence the possible combinations of functional groups (and rings) that would make possible each formula. (1/2 mark per correct response, some marks may be deduced for extra incorrect answers)

C_8H_{16} – alkene – ring (alkane ring)	$C_{12}H_{26}O_2$ – alcohol + alcohol – alcohol + ether – ether + ether

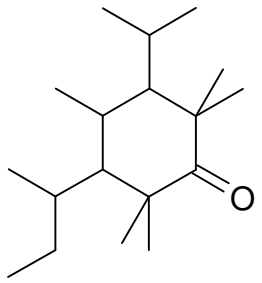
$C_{15}H_{30}O_2$

– carboxylic acid	– alcohol + alcohol + alkene
– ester	– alcohol + alcohol + ring
– aldehyde + alcohol	– alcohol + ether + alkene
– aldehyde + ether	– alcohol + ether + ring
– ketone + alcohol	– ether + ether + alkene
– ketone + ether	– ether + ether + ring

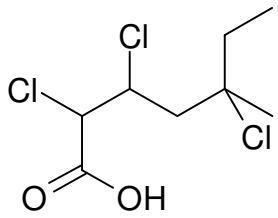
3. Provide common names and I.U.P.A.C. names for each of the following. If more than one common name exists, include both. Be sure to follow the rules when writing I.U.P.A.C. names. One mark per name

	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-buty 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

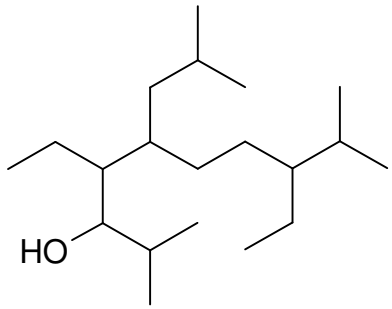
4. Provide full and correct I.U.P.A.C. names:



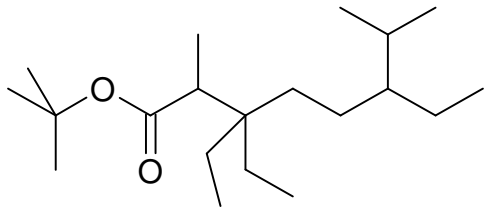
3-sec-butyl-5-isopropyl-2,2,4,6,6-pentamethyl-1-cyclohexanone



2,3,5-trichloro-5-methylheptanoic acid



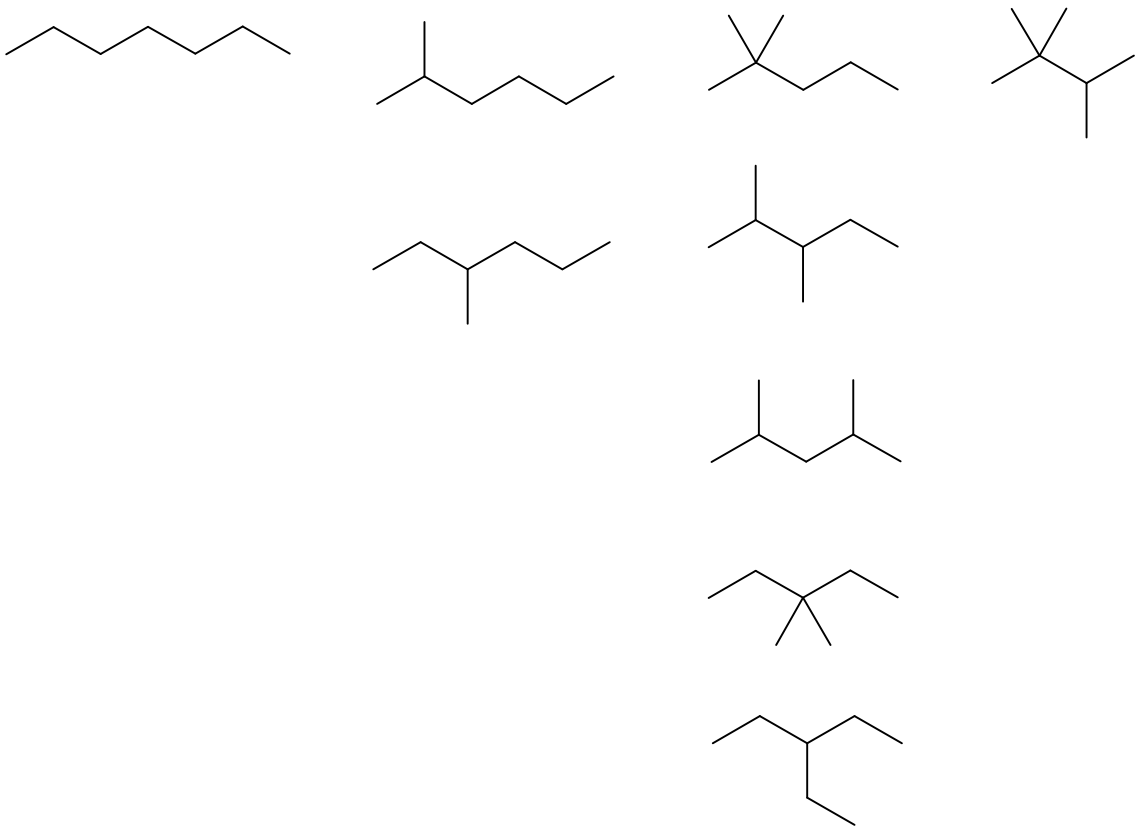
4,8-diethyl-5-isobutyl-2,9-dimethyl-3-decanol



t-butyl 3,3,6-triethyl-2,7-dimethyloctanoate

5. Provide all structural isomer for the following formula. Be sure to consider and unsaturation considerations as appropriate. Present your work in an organized fashion. Marks will be deduced for disorder. Also, marks will be deduced for duplicate (or triplicate etc. structures). Use only five and six member rings. Organize your structures according to the combination of functional groups rings etc. that make possible these formula:

C_7H_{16}



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C_6H_{12}