Name:

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.

$$0$$
 N --- 0
 N --- 0
 N

deg. unsat = 10

2-(2,6-Dioxo-piperidin-3-yl)-isoind ole-1.3-dione

 $\text{formula} = C_{13}H_{10}N_2O_4$

"thalidomide"

deg. unsat = 4

4-(2-Amino-ethyl)-benzene-1,2-diol

formula = $C_8H_{11}NO_2$

"dopamine"

2.

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

Characterize each formula by providing possible combinations of functional groups (and rings) that will satisfy the formula. (½ mark per correct response)

C₅₀H₁₀₂O

alcohol

ether

 $C_{12}H_{24}O_{2}$

carboxylic acid
ester
aldehyde + alcohol
aldehyde + ether
ketone + alcohol
ketone + ether

alcohol + alcohol + alkene
alcohol + alcohol + ring
alcohol + ether + alkene
alcohol + ether + ring
ether + ether + alkene

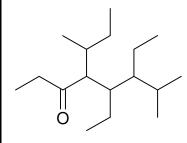
ether + ether + ring

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.
OH		
/011	methyl alcohol	1-methanol
ОН	isopropyl alcohol	2-propanol
ОН	secbutyl alcohol	2-butanol
ОН	isobutyl alcohol	2-methyl-1- propanol
ОН	t-buty alcohol	2-methyl-2- propanol
> 0	dimethyl ketone acetone	2-propanone
HO	acetic acid	ethanoic acid
$o \stackrel{H}{=} H$	formaldehyde	methanal
=	acetylene	1-ethyne
<u></u>	diethyl ether ether	
	diisopropyl ketone	2,4-dimethyl-3- pentanone

3-t-butyl-5-ethyl-1,1-dimethylcyclohexane

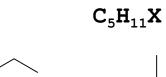
isopropyl 4-ethyl-2,3,3-trimethylhexanoate



4-secbutyl-5,6-diethyl-7-methyl-3-octanone

6-chloro-2,5-diethyl-3-isobutyl-1-heptanol

5. Provide all structural isomer for this formula. Present your work in an organized fashion. Marks will be deduced for duplicate (or triplicate etc. structures).



X

$$C_4H_{10}O$$