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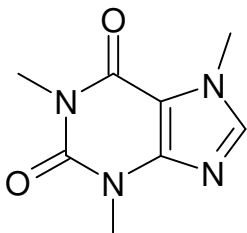
1. For each of the following structures determine the degree of
    unsaturation and use this information to determine the complete
    chemical formula. Please note that the saturation formula is
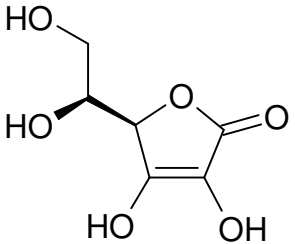   given in the next question.

Caffeine

deg. unsat = _____

formula =

be careful, those are methyl groups attached to the
nitrogen

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Ascorbic Acid (Vitamin C)

deg. unsat = _____

formula =

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2. $H = [2C + 2] - 2(deg. unsat) - X + N$
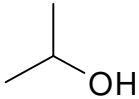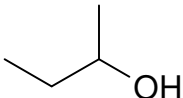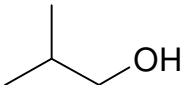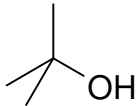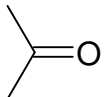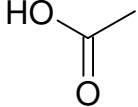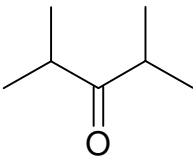
    The above saturation formula can be used to determine the degree
    of unsaturation for any organic compound. This information can
    be useful when trying to determine the various combinations of
    functional groups and rings that make possible a given chemical
    formula. For each of the following, write the possible
    combinations of functional groups and rings that can result in
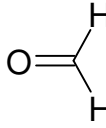   the given formula. Marks deduced for incorrect answers.

C_2H_4O	$C_6H_{13}N$
$C_{25}H_{50}O_2$	

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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

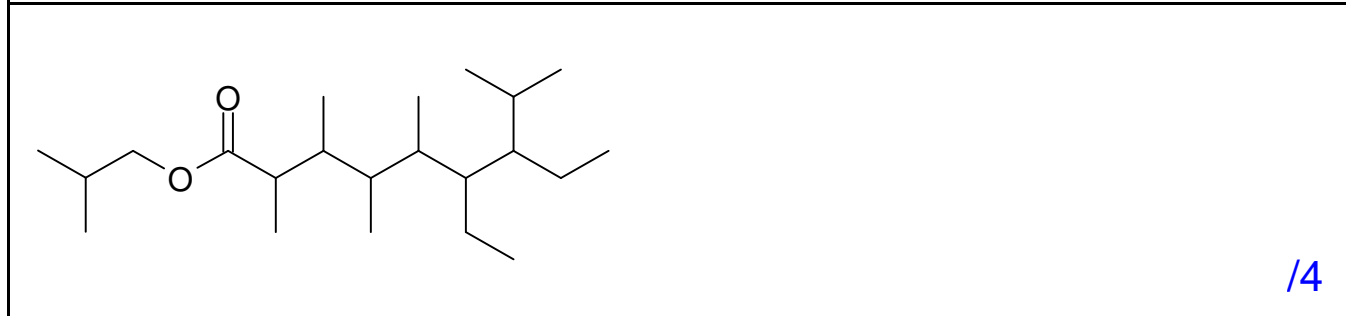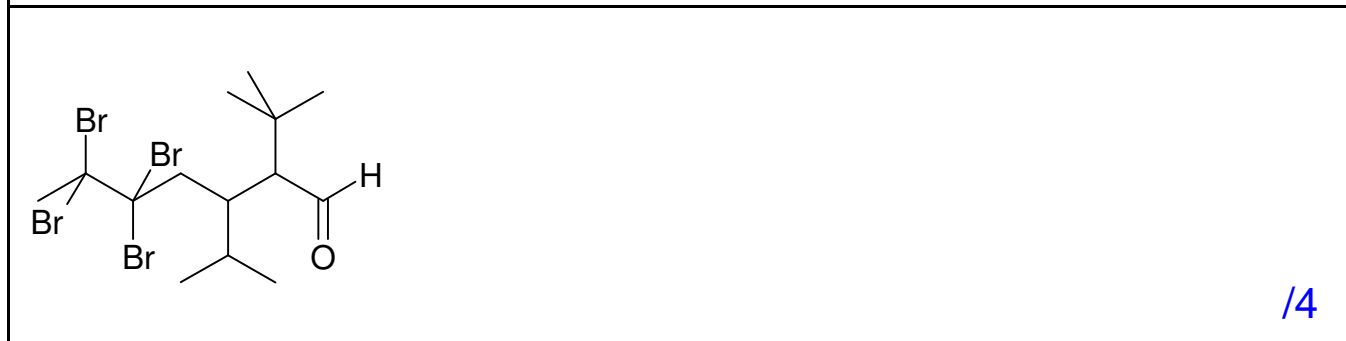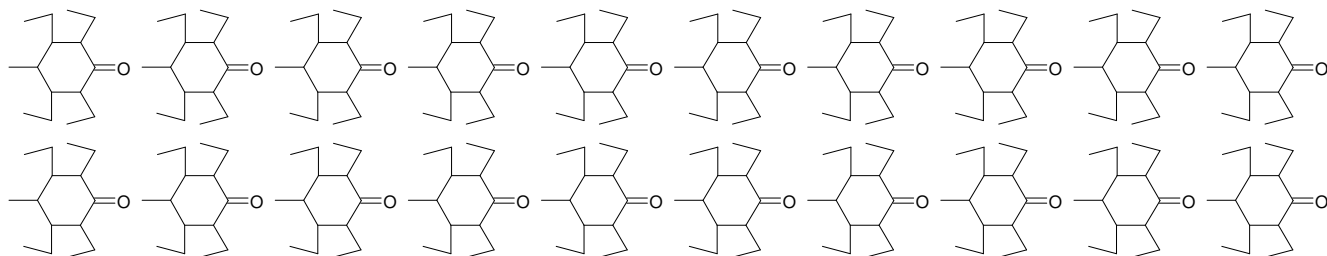|	Common Names	I.U.P.A.C.
CH₃CH₂OH (ethanol skeletal)		
(2-propanol skeletal)		
(2-butanol skeletal)		
(2-methyl-1-propanol skeletal)		
(2-methyl-2-propanol skeletal)		
(acetone skeletal)		
(acetic acid skeletal)		
(formaldehyde skeletal)		
(alkyne skeletal)		
(diethyl ether skeletal)		//////////
(2,4-dimethyl-3-pentanone skeletal)		

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/23

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

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Return of the Killer Ketones!!!

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5. Provide all structural isomer for this formula. Be sure to consider and unsaturation considerations that should be considered. 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.

$$C_4H_8O$$

Hint: must consider possible functional groups and saturation first!

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