Tutorial for Health Sciences and Pharmacy Students. Week 1

In the first week we looked at the nature of chemical bonding, how molecules are drown, identified several functional groups and leaned how to name chemical structures.

Question 1. Sometime it is possible to write out many different isomers for the same chemical formula. Write the structural formula for the constitutional isomers of the following molecules:

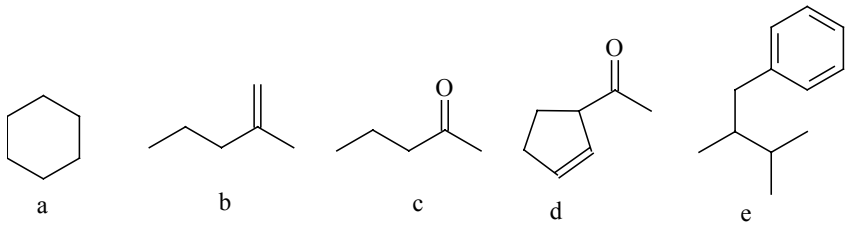
(a) C_2H_6O
(b) $C_4H_{10}O$
(c) $C_2H_4Cl_2$
(d) C_4H_9Br

Question 2. Extend the following condensed formulas as to show all the bonds and unshared electron pairs:

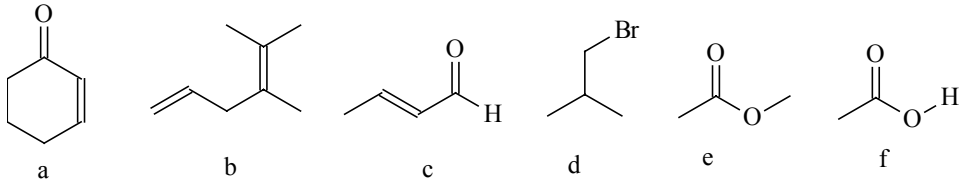
(a) $HOCH_2CH_2NH_2$
(b) CH_3CHCl_2
(c) $(CH_3)_2NCHO$
(d) HCO_{3-}
(e) (CH3)
(f) $CH_3NHCH_2CH_3$
(g) $(CH_3)_2CHCHO$
(h) $CH_3CH_2OCH_2CH_2CH_3OCH_3$

Question 3. Use the above examples and draw the structures using "chain of carbon atoms" *e.g.* where a line represents the $–CH_2-CH_2-$ bonds.

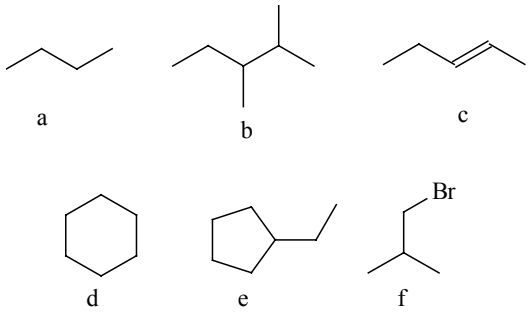
Question 4. Extend the following bond-line representation to show all the atoms including carbon and hydrogen.



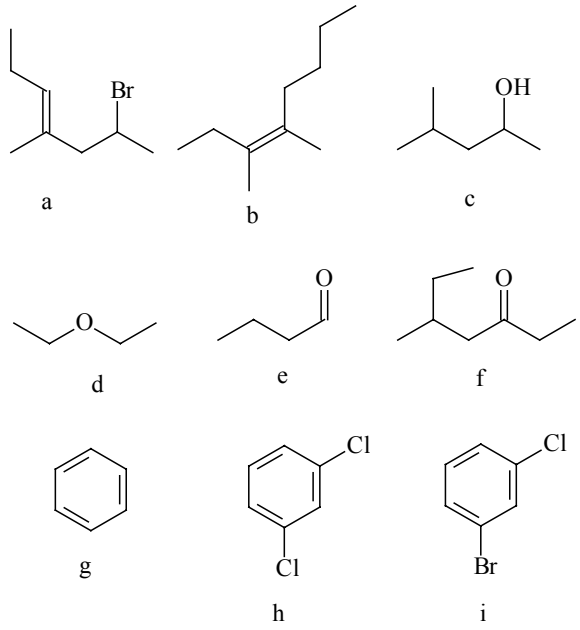
Question 5. Identify the various functional groups in the above molecules from Q4, and in the following compounds:



Question 6. Name the following molecules using the IUPAC rules described in the lectures.



Question 7. Name the following molecules using the IUPAC rules described in the lectures.



Question 8. Draw the structures for the IUPAC name given below.

(a) 4-Ethyloctane
(b) 4-Ethyl-3-methyloctane
(c) 4-Ethyl-3,5-dimethyloctane
(d) Ethylcyclopentane
(e) 3-Ethyl-1,1-dimethylcyclohexane
(f) 2,2,6,6,7-Pentamethyloctane
(g) 2,2,-Dimethylpropane
(h) 2,2,3,3-Tetramehtylbutane
(i) 1,1,-Diethyl-4-hexylcyclooctane
(j) Isopentane (not IUPAC name but a common name!)