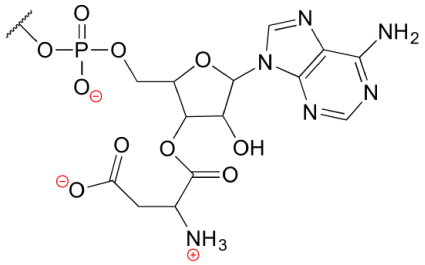
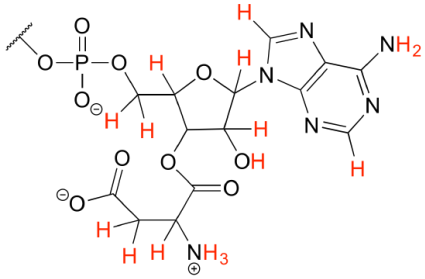
1.1: Solutions to selected Chapter 1 problems

P1.1:

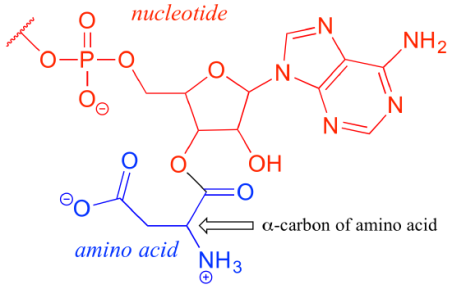
a) Formal charges are located as shown.



b) There are 16 hydrogen atoms:



c) The structure contains a nucleotide segment and an amino acid segment:



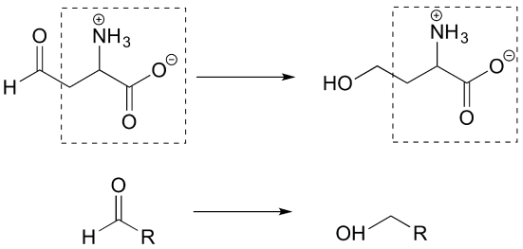
P1.4:

a)

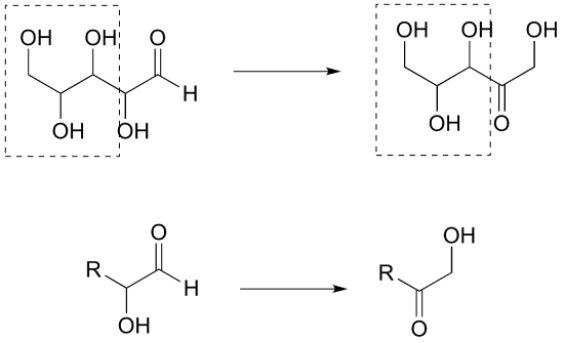
Reaction A: aldehyde to primary alcohol

Reaction B: Secondary alcohol to ketone; aldehyde to primary alcohol

b) The second structure from the right is an appropriate abbreviation. The part of the molecule in the box does not change in the reaction, and this can be abbreviated with 'R'.



c) The part of the molecule in the box does not change in the reaction, and this can be abbreviated with 'R'.



P1.5:

a) Threonine contains a secondary alcohol.

b) Glutamine and asparagine contain amides.

c) Cysteine contains a thiol.

d) Methionine contains a sulfide.

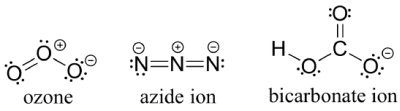
e) Tyrosine contains a phenol.

f) The lysine side chain contains a primary ammonium.

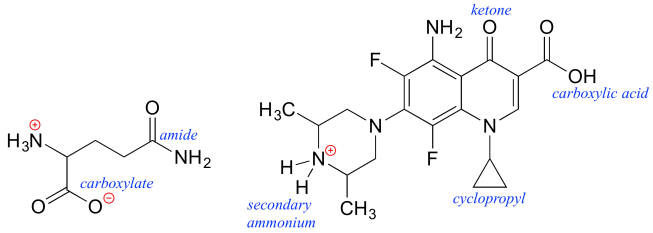
g) The glutamate and aspartate side chains contain carboxylates.

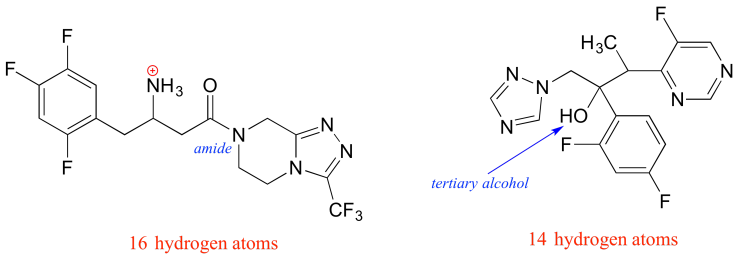
h) Proline contains a secondary amine.

P1.6: Note that according to VSEPR theory, ozone has bent geometry, azide ion is linear, and the geometry around the oxygen and carbon atoms of bicarbonate is bent.



P1.8:





P1.10: