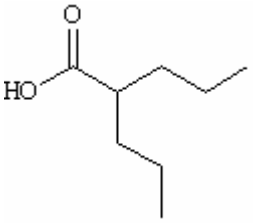
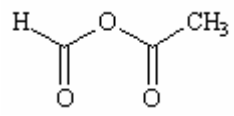
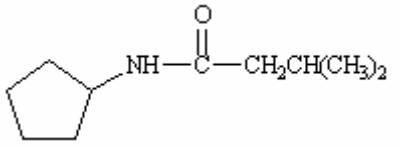
CH1010 Tutorial 3

Name:

1. Provide **IUPAC names** for the following compounds:







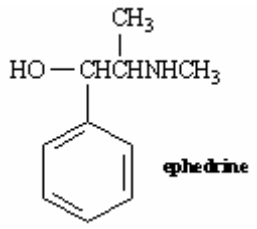
2. Draw **line-angle structures** corresponding to the following IUPAC names:

- 2-phenyl-2-propanol

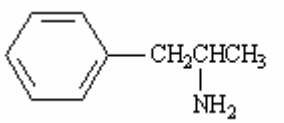
- 2,2-dimethyl-1,3-cyclopentanedione

- 2,4-hexanediamine

3. **Classify** each of the following **nitrogen atoms** in the following compounds as primary, secondary, tertiary, or quaternary.



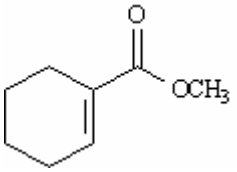
ephedrine

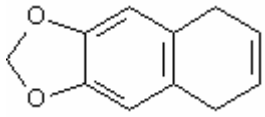


amphetamine

4. Cyclohexene and 2-hexyne both have the molecular formula C_6H_{10}. How would you use **infrared spectroscopy** to distinguish between the two compounds?

5. Circle any **conjugated portions** in the molecules below.





6. An impure organic solid was purified using two standard laboratory techniques.
   - Name **two techniques** that could be used for this **purification** and explain how they would separate the impurity from the pure material.

   The purified solid was analysed by combustion analysis and found to contain 40.0% carbon and 6.71% hydrogen. The electron impact mass spectrum provided a molecular ion at m/z 90.
   - Determine the **empirical** and **molecular formulae** for this compound.
   - Draw a **line-angle structure** for a possible molecule that obeys this molecular formula, and indicate how this could be verified using **infrared spectroscopy**.