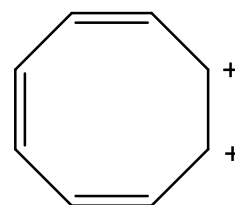
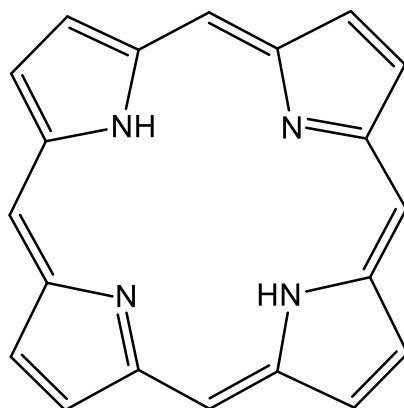
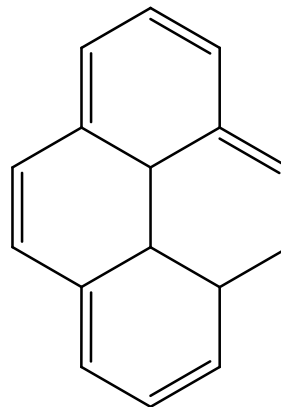
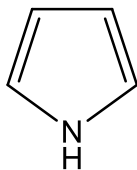
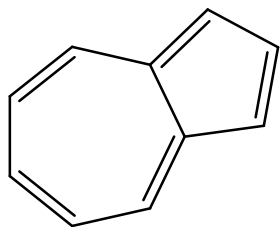


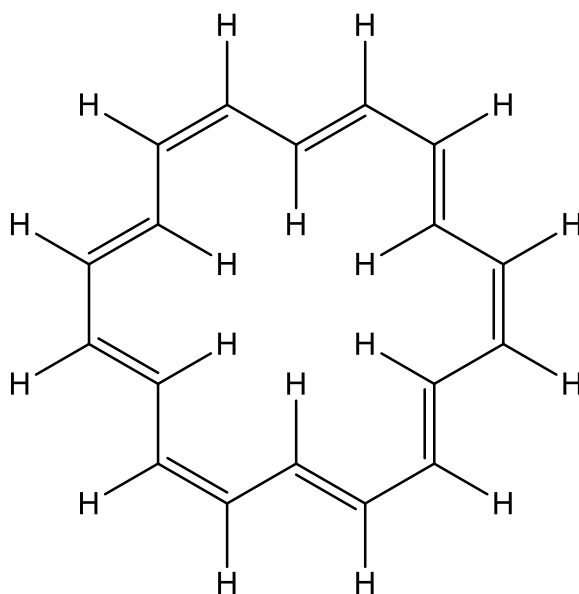
Problem Set 3 – Aromatic Systems

1. Which of the following structures represent aromatic systems?

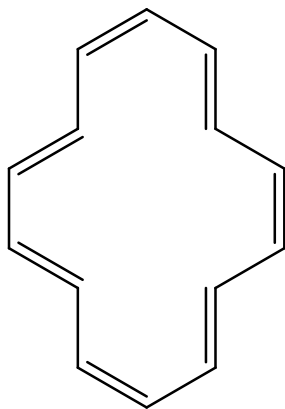


2. Sondheimer synthesized a series of conjugated cyclic polyalkenes which are known as [n]-annulenes where n indicates the size of the ring.

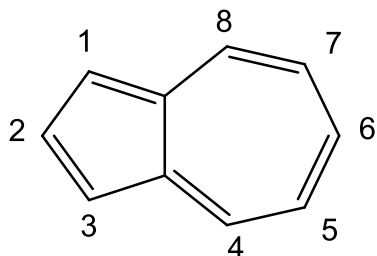
a. [18]-annulene, shown below, is aromatic. Explain.



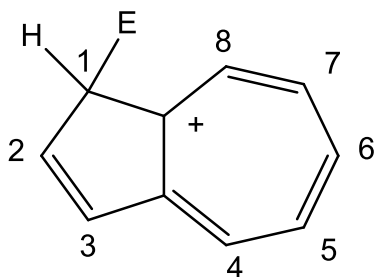
- b. [14]-annulene is not aromatic. It reacts with bromine at ambient temperature. Explain.



3. Azulene is readily attacked by electrophiles at C-1 and by nucleophiles at C-4.



- a. Azulene, is aromatic. Justify.
- b. One resonance structure of the cation formed by attack at carbon-1 is shown below. Justify electrophilic attack at this carbon.



- c. One resonance structure of the anion formed by attack at carbon-4 is shown below. Justify nucleophilic attack at this carbon.

