Chem 332 Exam 2 2009 Prof. Fox 50 minutes 80 points

Show your work in detail

## WRITE YOUR NAME ON EVERY PAGE

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1. Circle the molecules that are aromatic. No partial credit. 3 points each



2. Photolysis of compound **1** leads to equal amounts of two products — **2** and **3**. Upon heating, **2** leads exclusively to compound **4**, and **3** leads exclusively to **5**. (25 points)



- a. Provide structures for 2 and 3, and an arrow pushing mechanism for their formation.
- b. Use molecular orbital theory to explain the stereoselectivity for the formation of compounds 2 and 3.
- c. Provide an arrow pushing mechanism for the conversion of **2** into **4**, and for the conversion of **3** into **5**. Molecular orbital analysis is NOT required for this subquestion.

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## 2. continued

3. Compound **6** reacts with EtMgBr to give an anionic product that, upon treatment with DCl, produces **7**. However, an attempt to carry out a similar reaction with **8** is unsuccessful, as product **9** is not produced.



Explain why the reaction to form **7** is successful. Explain why the reaction to form **9** is unsuccessful. (20 points)

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4. Provide a detailed arrow pushing mechanism. Molecular orbital analysis is NOT required. (20 points)

