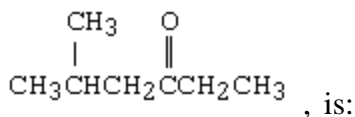


No electronic devices (calculators, cell phones, laptops, etc) may be used or consulted during the exam. All scrap work should be done on the extra page provided; no additional paper may be used. **Your name and Panther ID should be placed** at the end of this paragraph to indicate acceptance of all policies and on your answer sheet. Be sure to include **the form of your exam on the answer sheet.**

Name _____ Panther ID _____

Part A (51 points, 3 each): Enter on answer sheet with number 2 pencil

1.



A correct name for the compound,

- A) 2-Methyl-4-hexanone
B) 2-Methyl-3-hexanone
C) 5-Methyl-3-hexanone
D) Ethyl isopropyl ketone
E) Isobutylpropanone

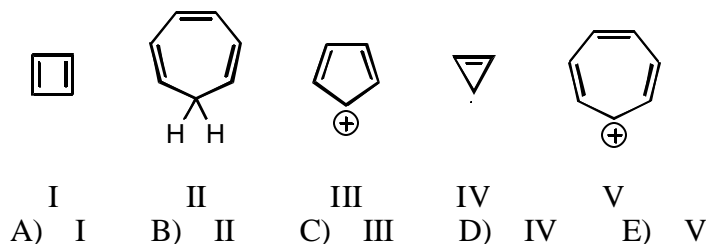
2. Which of the following is NOT true of benzene?

- A) Benzene tends to undergo substitution rather than addition reactions, even though it has a high index of hydrogen deficiency.
B) All of the hydrogen atoms of benzene are equivalent.
C) The carbon-carbon bonds of benzene are alternately short and long around the ring.
D) Only one *o*-dichlorobenzene has ever been found.
E) Benzene is more stable than the hypothetical compound 1,3,5-cyclohexatriene.

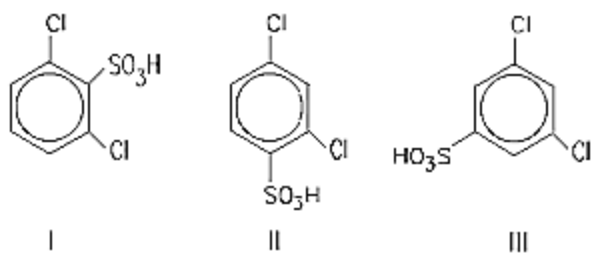
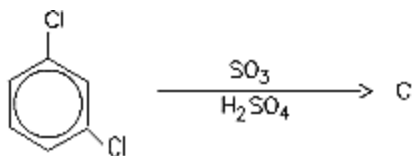
3. Which annulene would you NOT expect to be aromatic?

- A) [6]-Annulene
B) [14]-Annulene
C) [16]-Annulene
D) [18]-Annulene
E) [22]-Annulene

4. On the basis of molecular orbital theory and Huckel's rule, which of these compounds should be aromatic?



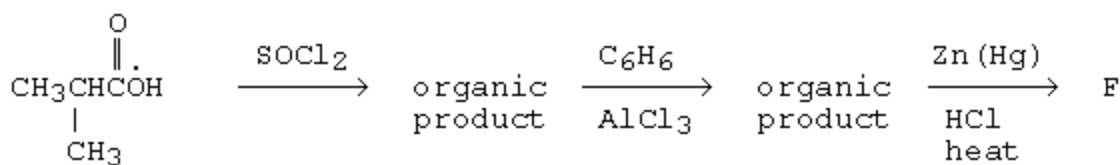
5. The major product(s), C, of the following reaction,



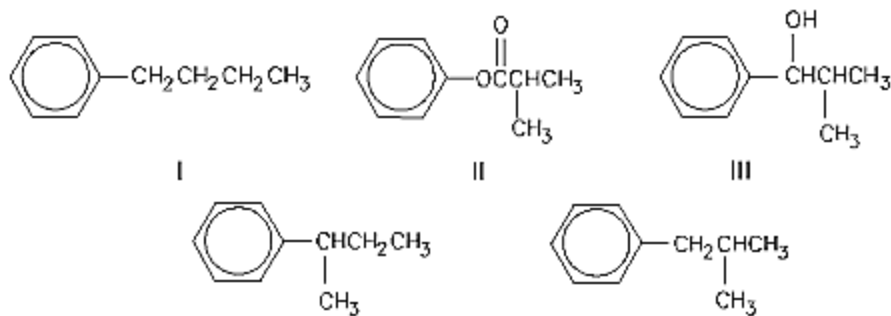
would be:

- A) I B) II C) III D) Equal amounts of I and II E) Equal amounts of I and III

6. The product, F, of the following reaction sequence,

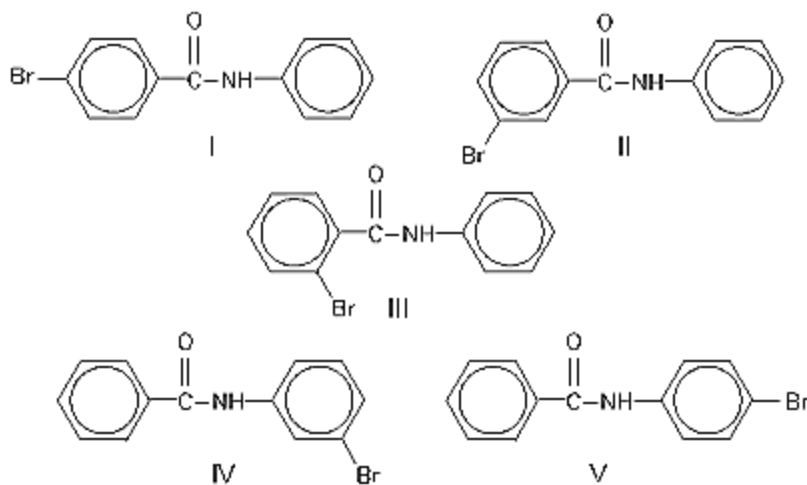
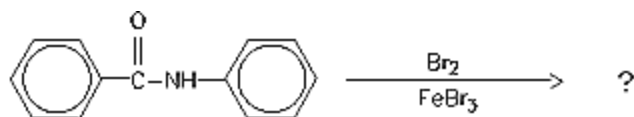


would be:



- A) I B) II C) III D) IV E) V

7. What would you expect to be the major product obtained from the following reaction?

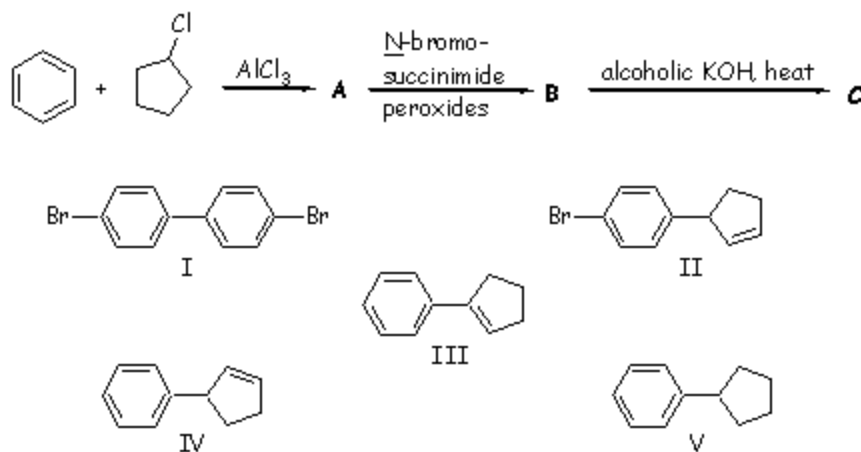


A) I B) II C) III D) IV E) V

8. Consider the molecular orbital model of benzene. In the ground state how many molecular orbitals are filled with electrons?

A) 1 B) 2 C) 3 D) 4 E) 5

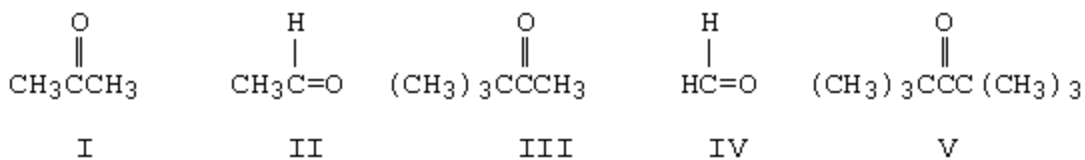
9. The product, C, that would result from the following series of reactions,



would be:

A) I B) II C) III D) IV E) V

10. What, in general, is the order of decreasing reactivity of these carbonyl compounds towards nucleophilic reagents?



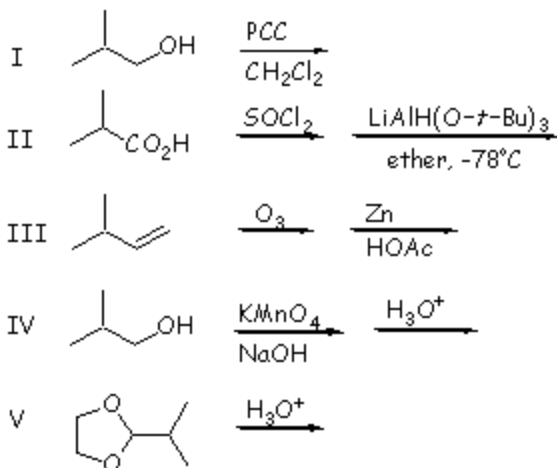
- A) I > III > V > II > IV
 B) IV > II > I > III > V
 C) V > III > I > II > IV
 D) II > I > V > III > IV
 E) III > V > IV > II > I

11. The relationship of propanone and propen-2-ol is designated by the term:

- A) Tautomers
 B) Conformational isomers
 C) Diastereomers
 D) Resonance structures
 E) Stereoisomers

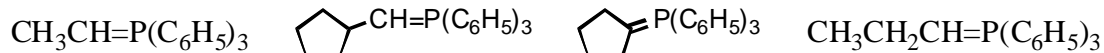
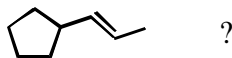
12.

Which of the following procedures would not yield $(\text{CH}_3)_2\text{CHCHO}$ as a product?



- A) I B) II C) III D) IV E) V

16. Which Wittig reagent would be used to synthesize



- A) I B) II C) III D) IV E) III IV
Either I or II could be used.

17. Cyclopentadiene is unusually acidic for a hydrocarbon. An explanation for this is the following statement.

- A) The carbon atoms of cyclopentadiene are all sp^2 -hybridized.
B) Cyclopentadiene is aromatic.
C) Removal of a proton from cyclopentadiene yields an aromatic anion.
D) Removal of a hydrogen atom from cyclopentadiene yields a highly stable free radical.
E) Removal of a hydride ion from cyclopentadiene produces an aromatic cation.

Answer Key

1. C
2. C
3. C
4. E
5. B
6. E
7. E
8. C
9. C
10. B
11. A
12. D
13. D
14. D
15. B
16. E
17. C