

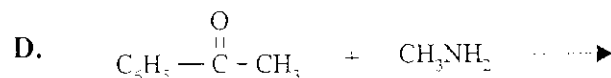
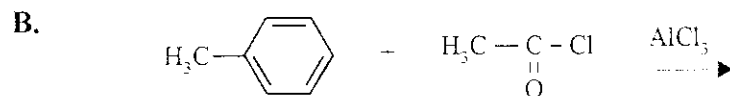
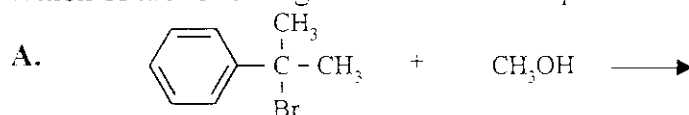
Name:

Student Number:

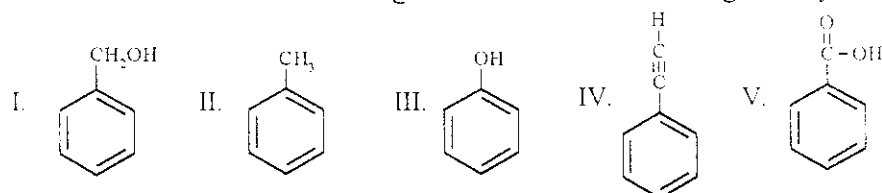
This exam contains 7 pages: no scratch or loose paper; no pencil; **BE NEAT.**

PART I. Choose the best answer of each question and **CIRCLE** the letter of your selection. No penalty will be given for wrong answers.

1. Which of the following reactions does not proceed under normal conditions?



2. Which of the following is the order of increasing acidity?



A. III, II, V, I, IV

B. II, III, IV, V, I

C. II, IV, I, III, V

D. IV, II, III, I, V

A. None of the above

3. To convert CH₃CH₂OH to (CH₃)₂C(OH)(CN), a certain sequence of steps is required. These steps are listed below. Arrange them in the appropriate order [each step may be used once, more than once, or not at all]

1. NaCN

5. H₂O₂, NaOH

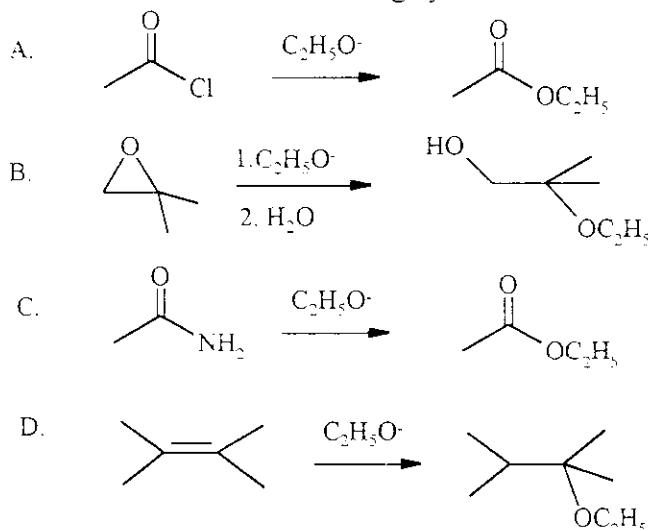
9. Pyridinium chlorochromate

2. CH₃MgBr6. NH₃10. H₂SO₄, heat

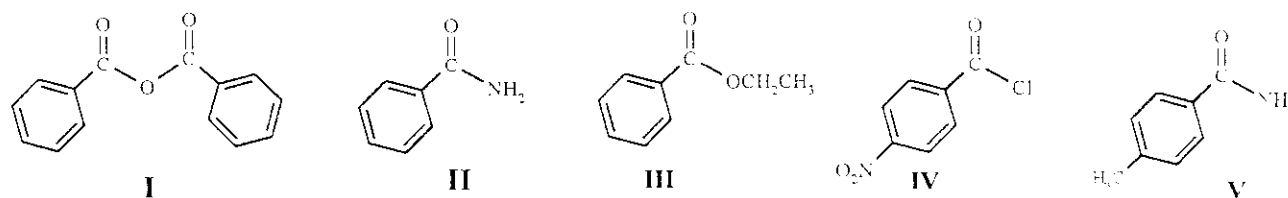
3. KMnO_4 7. Dilute H_2SO_4
 4. CH_3Br 8. B_2H_6

- A. 10,2,4,1,6
 B. 2,4,7,9,8,6
 C. 3,2,4,9,1,6
 D. 9,2,3,1

4. Which of the following syntheses is correct?



5. Arrange the following molecules in order of increasing reactivity in nucleophilic addition-elimination.

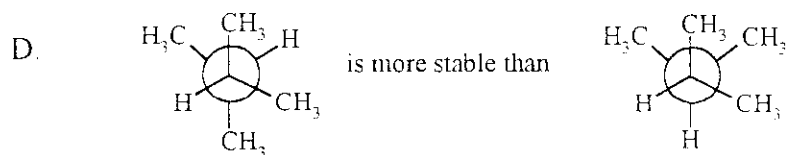
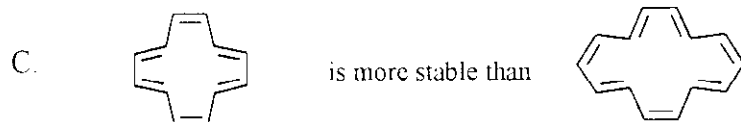
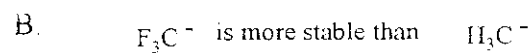
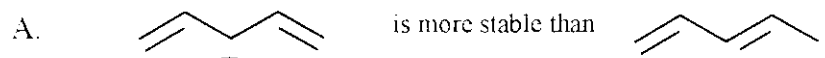


- A. II, IV, V, III, I
 B. I, II, IV, V, III
 C. V, III, I, IV, II
 D. I, V, III, IV, II
 E. V, II, III, I, IV

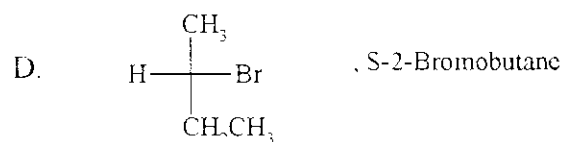
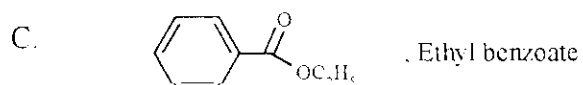
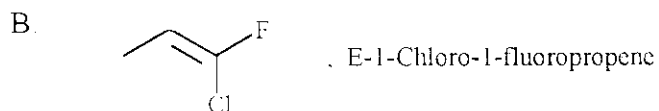
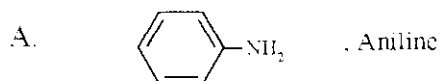
6. Which reagent reacts with propanal to yield a semicarbazone?

- A. $\text{H}_2\text{N}-\text{NH}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$ B. NH_2NH_2
 C. PhNHNH_2 D. NH_2OH
 E. $\text{H}_2\text{N}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$

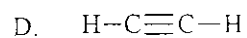
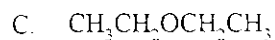
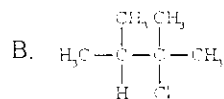
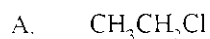
7. Circle the incorrect statement:



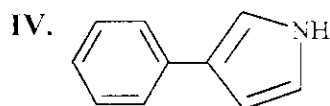
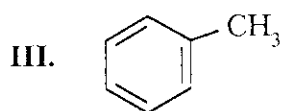
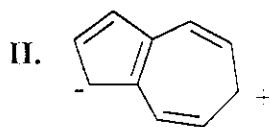
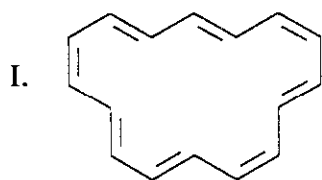
8. Which of the following compounds is misnamed?



9. Which of the following would not react with the amide ion NH_2^- ?

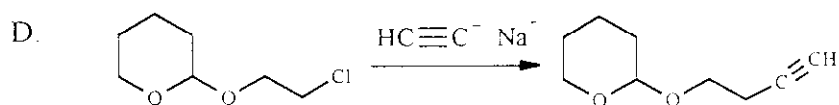
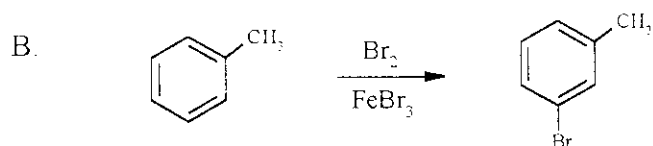
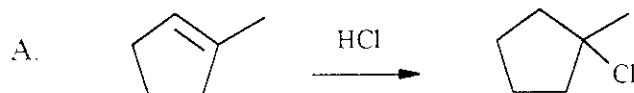


10. Which of the following molecules can be considered aromatic?

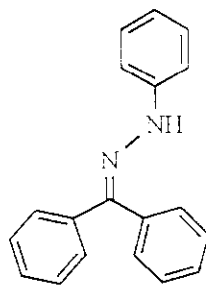


- A. III only
- B. I and III
- C. III and IV
- D. II, III and IV
- E. I, II and III

11. Which of the following syntheses is unlikely to be correct?

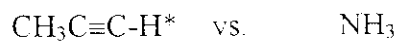


12. The name of the following molecule is:

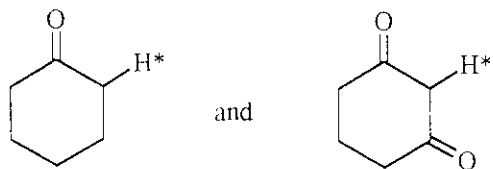


Part II. Circle the stronger acid in each of the following pairs (consider only the acidity of the indicated * hydrogen)

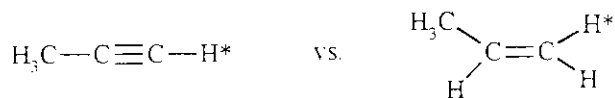
1.



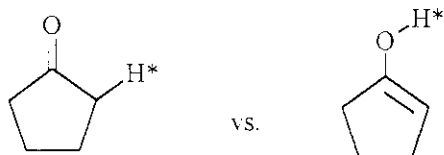
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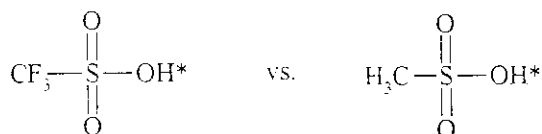
3.



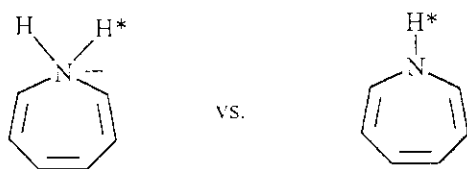
4.



5.

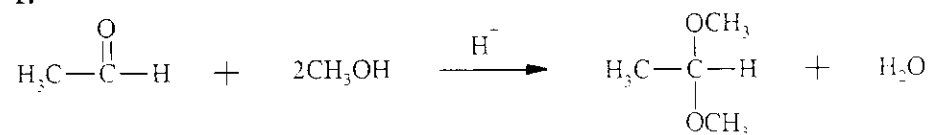


6.



Part III. Write a reasonable mechanisms for the following transformations:

1.



2.

