Chem 2320
Exam 2

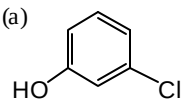
February 25, 2005

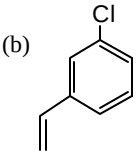
Name:_____ (**Please print**)
(first) (last)

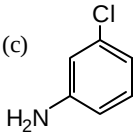
Last 4 digits of I.D. ___ ___ ___ ___	Score
I. Multiple Choice (/20)	/60
II	/20
III	/10
IV	/10
Total score	/100

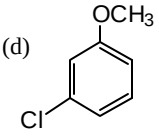
I. Multiple choice questions. (3 points each). Please put your answers on Scantron sheet. Your score will be graded based only on your answers from Scantron sheet.

1. What's the structure of *m*-chloroanisole?

(a) 

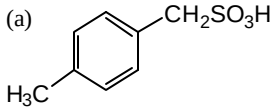
(b) 

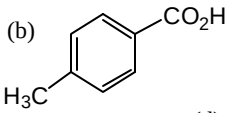
(c) 

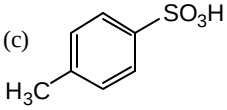
(d) 

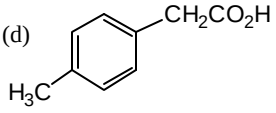
(e) None of the above

2. What's the structure of *p*-methylbenzoic acid?

(a) 

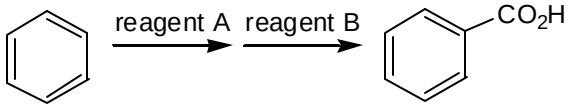
(b) 

(c) 

(d) 

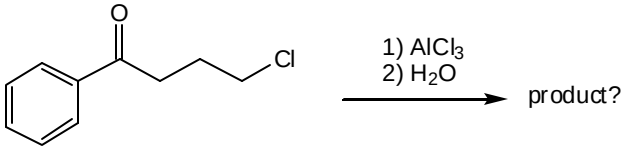
(e) None of the above

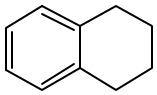
3. What reagents (conditions) are needed for the following reaction?

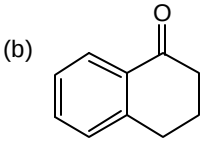


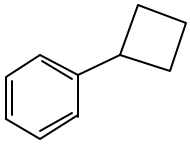
(a) reagent A: $CH_3COCl/AlCl_3$; reagent B: Sn, HCl, heat
(b) reagent A: $CH_3CH_2Cl/AlCl_3$; reagent B: $KMnO_4$, heat
(c) reagent A: $CH_3COCl/AlCl_3$; reagent B: H_2NNH_2, KOH, H_2O, heat
(d) reagent A: HNO_3, H_2SO_4; reagent B: Sn, HCl, heat
(e) None of the above

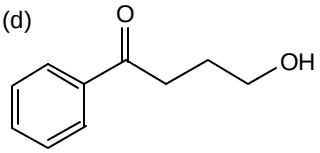
4. What could be the product for the following reaction?



(a) 

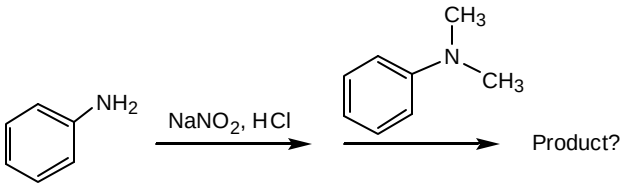
(b) 

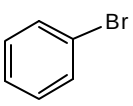
(c) 

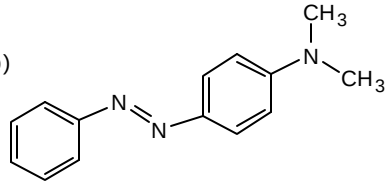
(d) 

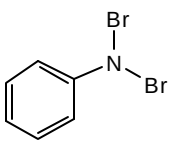
(e) None of the above

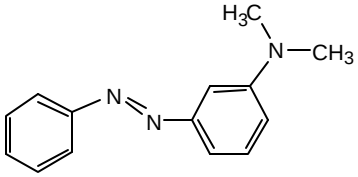
5. What could be the product for the following reaction?



(a) 

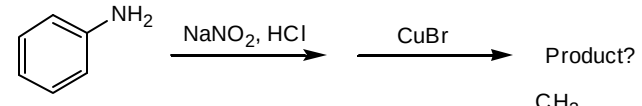
(b) 

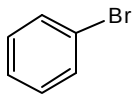
(c) 

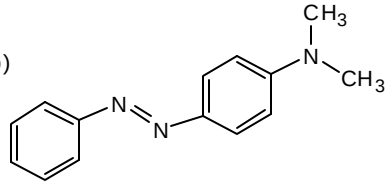
(d) 

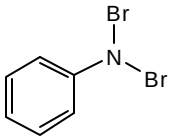
(e) None of the above

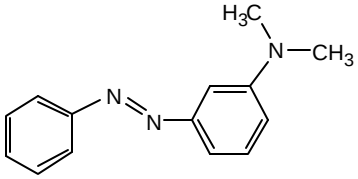
6. What could be the product for the following reaction?



(a) 

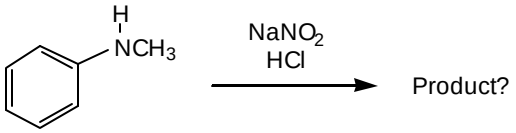
(b) 

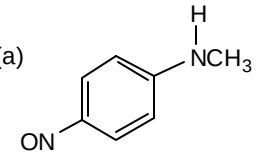
(c) 

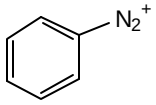
(d) 

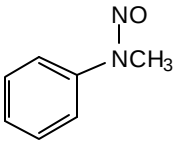
(e) None of the above

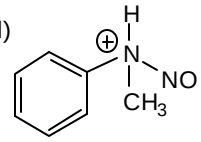
7. What could be the product for the following reaction?



(a) 

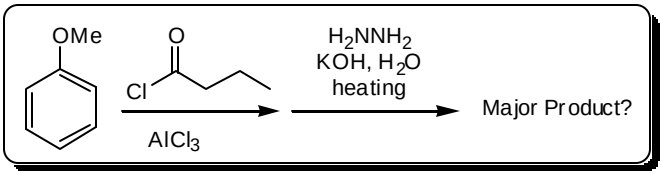
(b) 

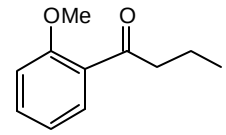
(c) 

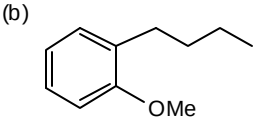
(d) 

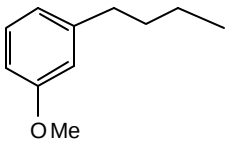
(e) None of the above

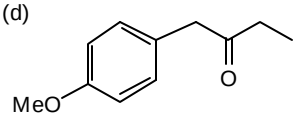
8. What could be the major product for the following reaction?



(a) 

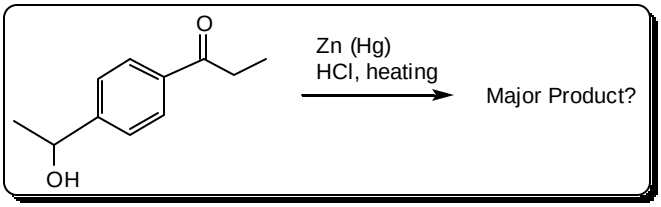
(b) 

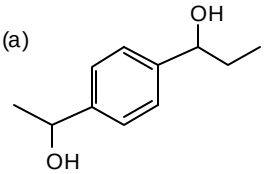
(c) 

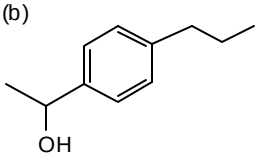
(d) 

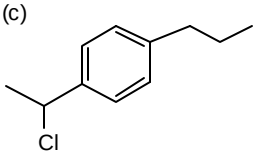
(e) None of the above

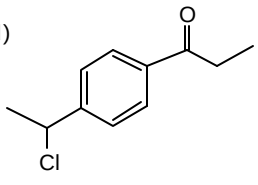
9. What could be the product for the following reaction?



(a) 

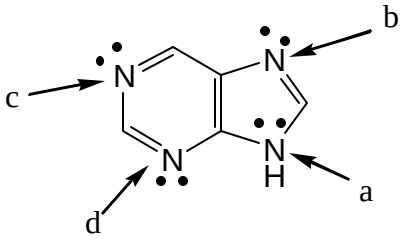
(b) 

(c) 

(d) 

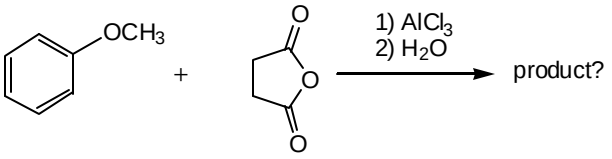
(e) None of the above

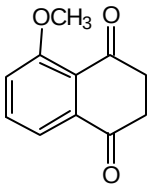
10. For the following compound, which nitrogen is most apt to be protonated?



(a) Nitrogen indicated by arrow “a”
(b) Nitrogen indicated by arrow “b”
(c) Nitrogen indicated by arrow “c”
(d) Nitrogen indicated by arrow “d”
(e) None of the above

11. What could be the product for the following reaction?



(a)


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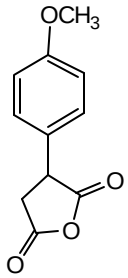

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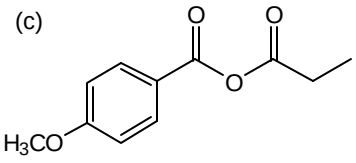
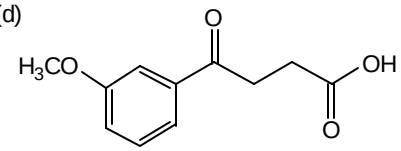
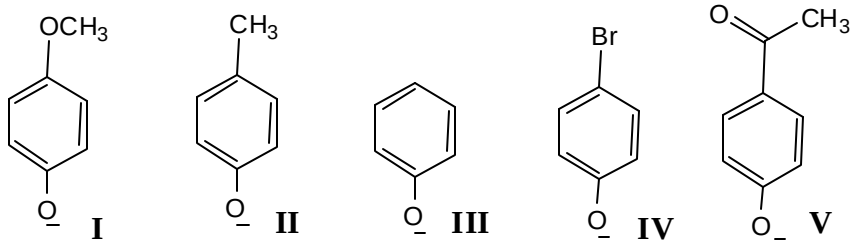


(d)


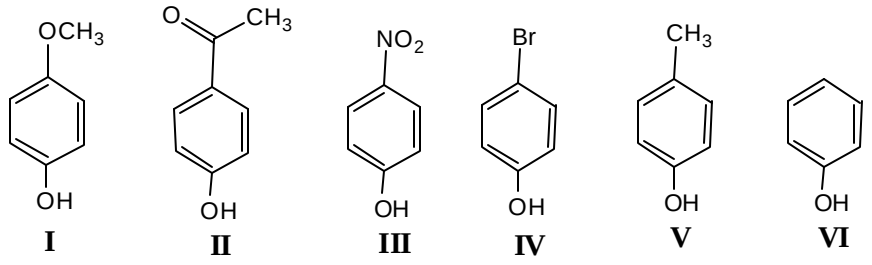
(e) None of the above

12. What is the correct order of decreasing basicity for the following anions (from the most to the least)?



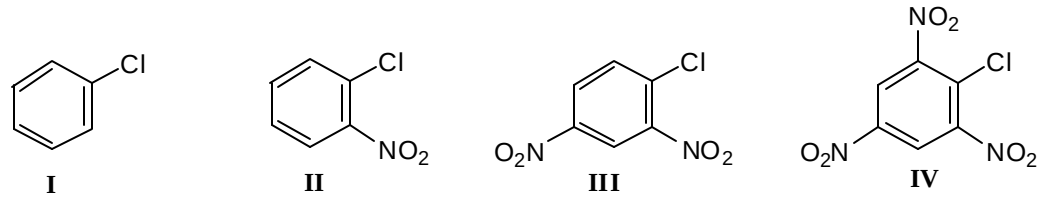
(a) I>II>III>IV>V
(b) I>II>III>V>IV
(c) I>II>IV>III>V
(d) V>IV>III>II>I
(e) None of the above

13. What is the correct order of decreasing acidity for the following phenol and phenol derivatives (from the most to the least)?



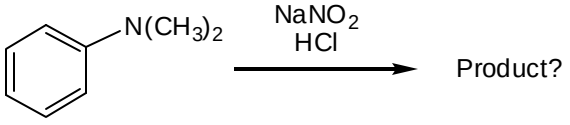
(a) I>II>III>IV>V>VI
(b) II>III>IV>VI>V>I
(c) III>II>IV>VI>V>I
(d) II>III>IV>VI>I>V
(e) None of the above

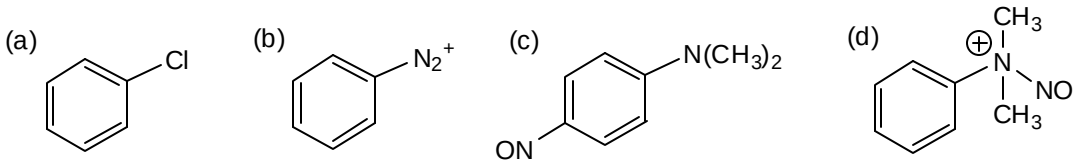
14. What is the correct order of decreasing reactivity (fastest to slowest) toward nucleophilic aromatic substitution for the following compounds?



(a) I>II>III>IV
(b) II>III>IV>I
(c) III>II>IV>I
(d) IV>III>II>I
(e) None of the above

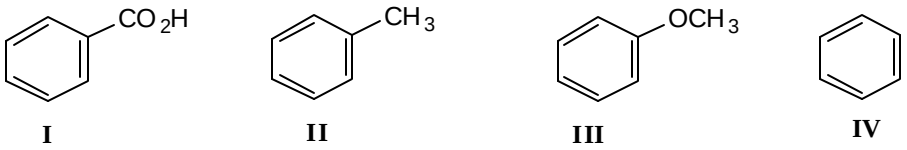
15. What could be the product for the following reaction?





(e) None of the above

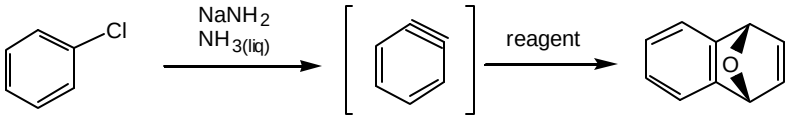
16. What is the correct order of decreasing reactivity (fastest to slowest) toward electrophilic aromatic substitution for the following compounds?



I II III IV

(a) I>II>III>IV
(b) II>I>IV>III
(c) III>II>IV>I
(d) IV>III>II>I
(e) None of the above

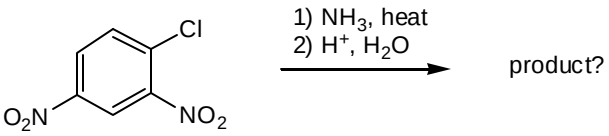
17. What could be the product for the following reaction?

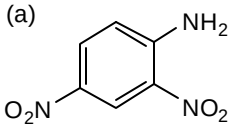


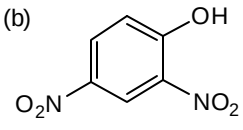
(a) 
(b) 
(c) 
(d) 

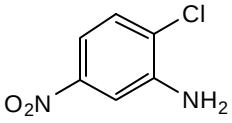
(e) None of the abov e

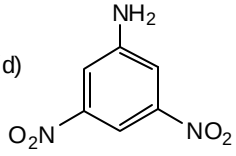
18. What could be the product for the following reaction?



(a) 

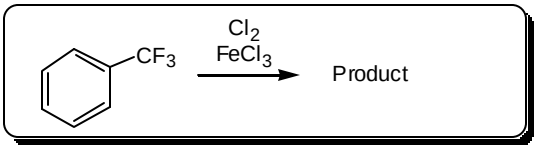
(b) 

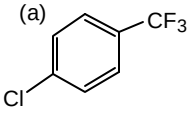
(c) 

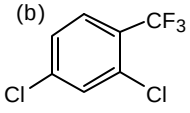
(d) 

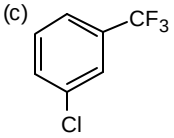
(e) None of the above

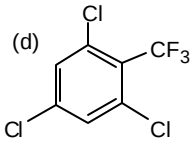
19. Which could be the major product of the following reaction?



(a) 

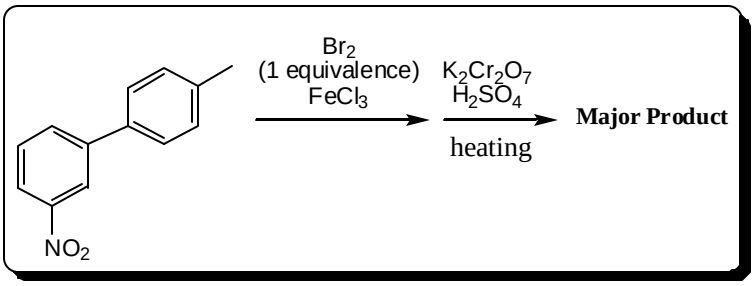
(b) 

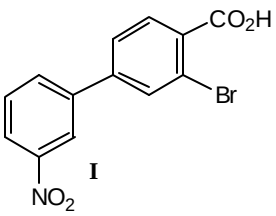
(c) 

(d) 

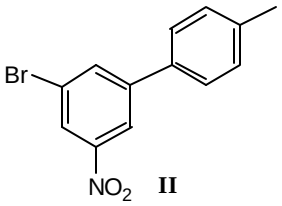
(e) none of the above

20. Which could be the major product of the following reaction?

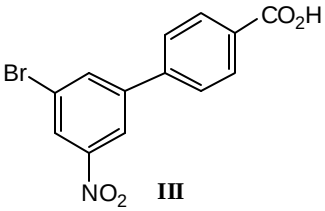




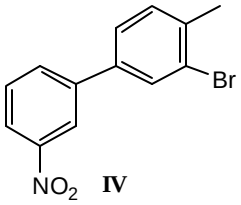
I



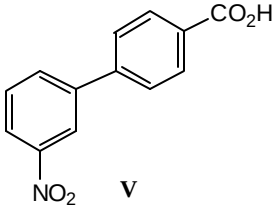
II



III



IV



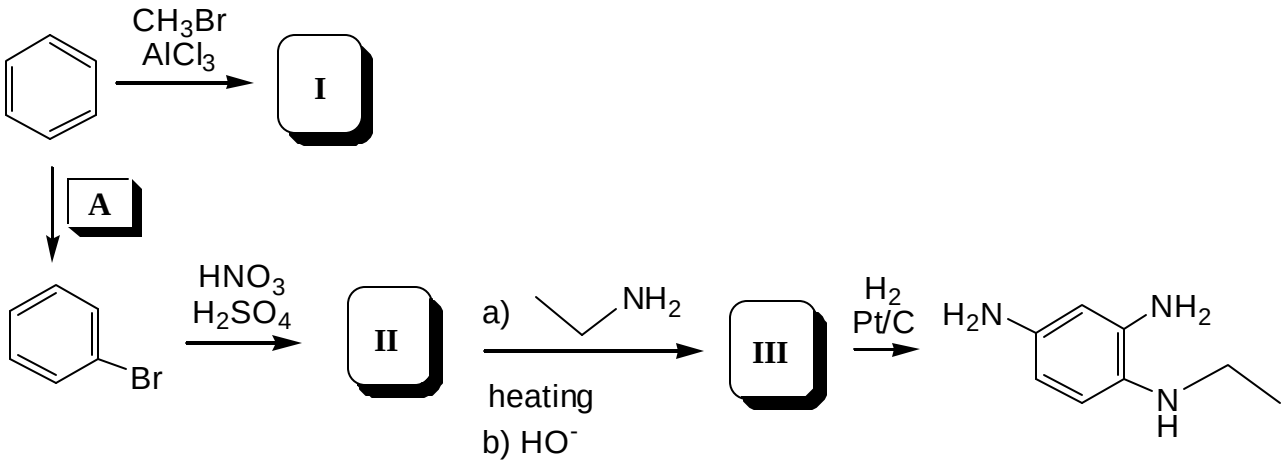
V

(a) I
(b) II
(c) III
(d) IV
(e) V

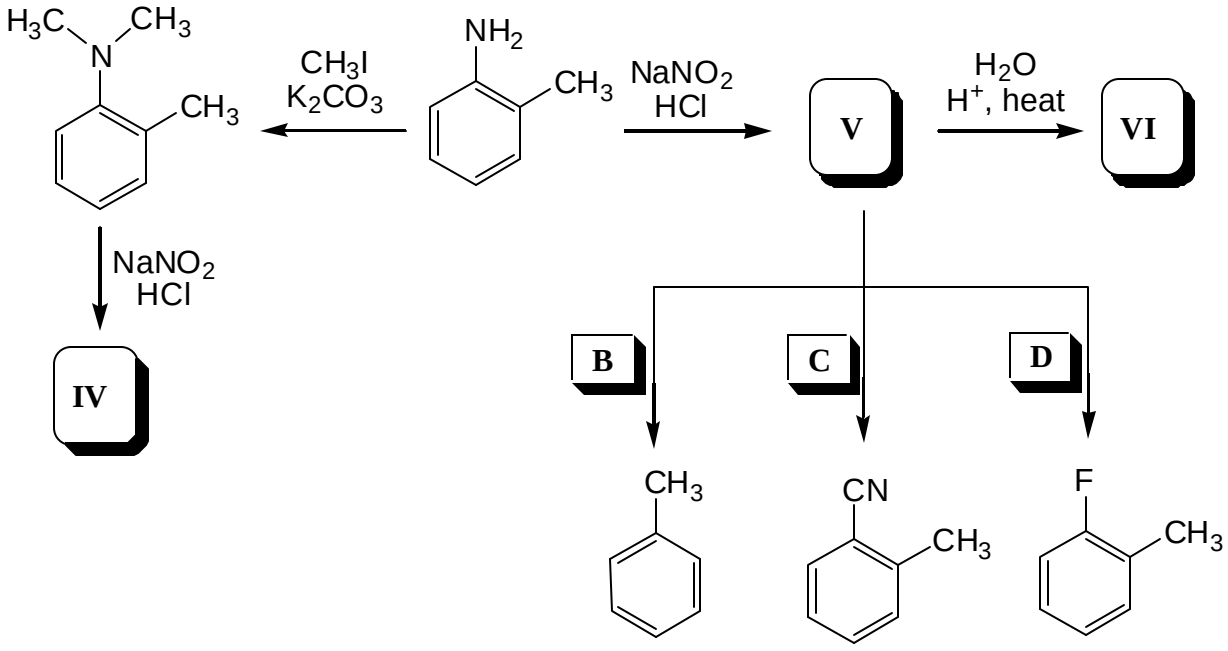
Continue to the next page

II. Use the table on the next page and provide the correct structures of compounds and reagents. **No partial point** will be awarded if you place your answer in the wrong box. (20 points)

A. Multiple-step Synthesis



B. Multiple-step Synthesis



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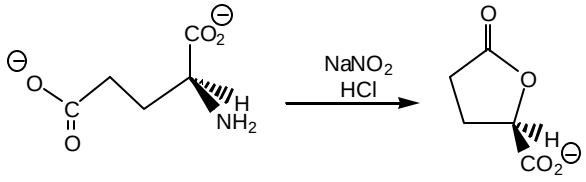
I:	**II:**	**III:**
IV:	**V:**	**VI:**
A:	**B:**	**C:**
D:		

Continue to the next page

III. Propose an electron-pushing mechanism for the following reaction. (10 points)



Continue to the next page

IV. Show how the following compound could be prepared from benzene. You can use any reactants with four or less carbons. (10 points)