

國立臺北科技大學九十七學年度碩士班招生考試

系所組別：3620 生物科技研究所乙組

第二節 有機化學 試題

填准考證號碼

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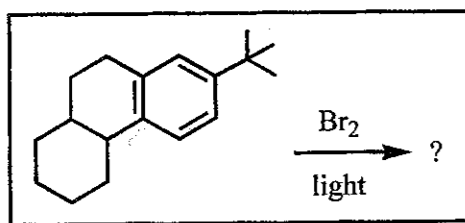
第一頁 共六頁

注意事項：

1. 本試題共 28 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

I. Please choose a best answer for the following questions (3 points each; total 75 points)

1. What would be the expected **major** product of the following reaction?

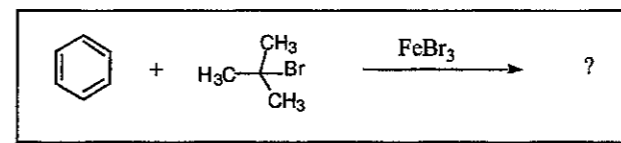


- A)
- B)
- C)
- D)
- E)

2. Which of the following carbocations would you expect to be **most** stable?

- A)
- B)
- C)
- D)
- E)

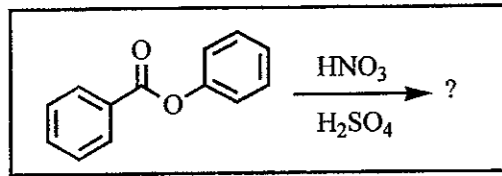
3. What is/are the product(s) in the following Friedel-Crafts Reaction?



- A)
- B)
- C)
- D) Both A and B
- E) All of the above

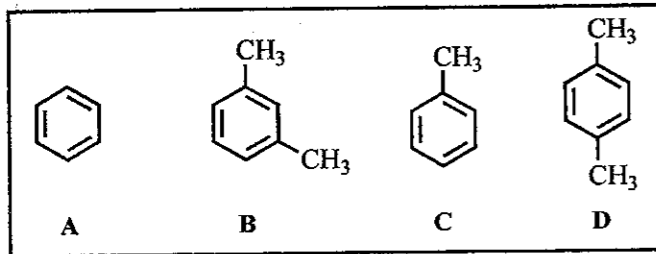
注意：背面尚有試題

4 What product(s) would you expect from the following reaction?



- A) B)
- C) D)
- E) Both B and D

5 Rank the following in order of **decreasing** reactivity toward nitration. (more reactive > less reactive)

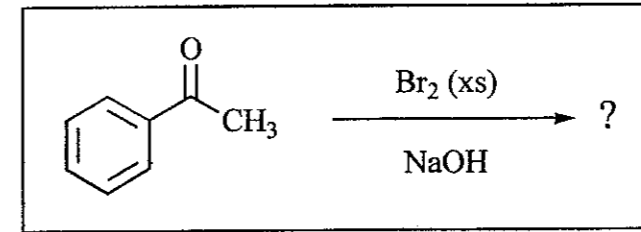


- A) $\text{D} > \text{C} > \text{B} > \text{A}$ B) $\text{B} > \text{D} > \text{C} > \text{A}$
- C) $\text{D} > \text{B} > \text{C} > \text{A}$ D) $\text{C} > \text{D} > \text{B} > \text{A}$
- E) $\text{A} > \text{C} > \text{D} > \text{B}$

6 Which of the following would react with Ag^+ under basic conditions?

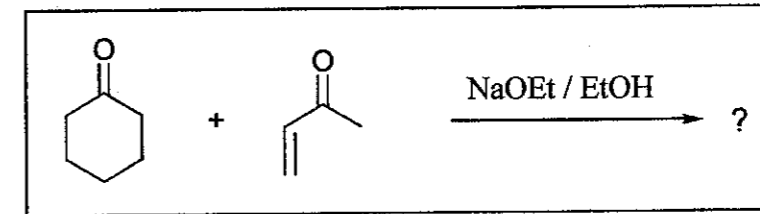
- A) B)
- C) $\text{CH}_3\text{CH}_2\text{CO}_2\text{CH}_2\text{CH}_3$ D)
- E)

7 What would be the expected result of the following reaction?



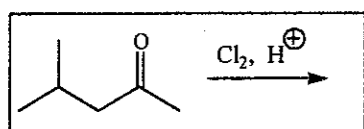
- A) B)
- C) D)
- E)

8 Predict the major organic product of the following reaction.



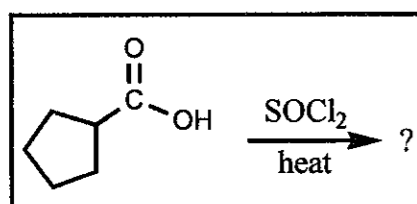
- A) B)
- C) D)
- E)

9 Predict the product of the following reaction:



- A)
- B)
- C)
- D)
- E)

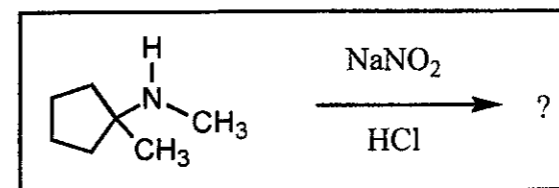
10 What would be the major organic product of the following reaction?



- A)
- B)
- C)
- D)
- E)

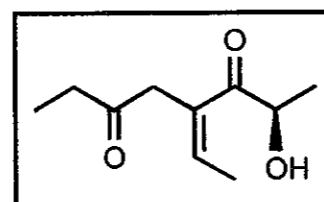
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11 What is the result of the reaction shown?



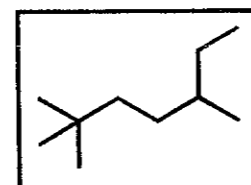
- A)
- B)
- C)
- D)
- E)

12 In the following molecule, how many carbon atoms are in the sp^2 hybridization state?



- A) 0
- B) 1
- C) 2
- D) 4
- E) 6

13 What is the correct IUPAC name for the following molecule?



- A) 1,1,1,4-tetramethylhexane
- B) 4-ethyl-1,1,1-trimethylpentane
- C) 5-ethyl-2,2-dimethylhexane
- D) 3,6,6,6-tetramethylhexane
- E) 2,2,5-trimethylheptane

注意：背面尚有試題

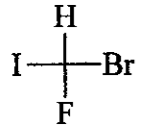
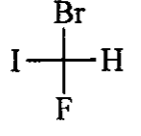
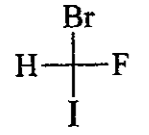
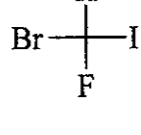
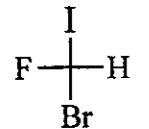
14 Give the relative reactivity in decreasing order for free radical halogenation of $(\text{CH}_3)_3\text{CH}$.

- A) $\text{F} > \text{Cl} > \text{Br}$ B) $\text{Cl} > \text{Br} > \text{F}$
 C) $\text{Br} > \text{F} > \text{Cl}$ D) $\text{Br} > \text{Cl} > \text{F}$
 E) $\text{I} > \text{F} > \text{Cl}$

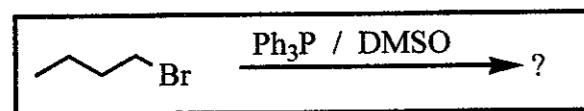
15 Which of the following disubstituted cyclohexanes could exist in a conformation which has both groups equatorial?


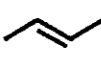
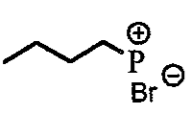
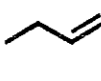
- A) *cis*-1,3-dimethylcyclohexane B) *cis*-1,4-dimethylcyclohexane
 C) *trans*-1,3-dimethylcyclohexane D) *cis*-1,2-dimethylcyclohexane
 E) all or none can have both groups equatorial.

16 The correct structure for (*R*)-bromofluoroiodomethane is:

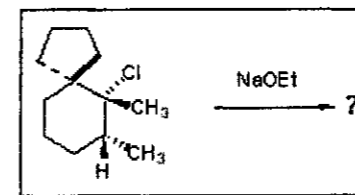
- A)  B) 
 C)  D) 
 E) 

17 What is the major product of the following reaction:



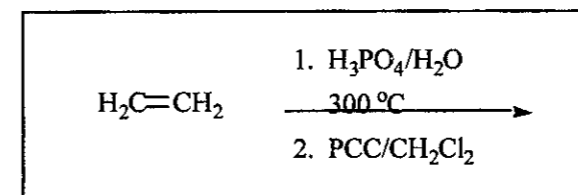
- A)  B) 
 C)  D) 
 E) No reaction occurs

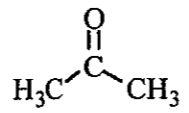
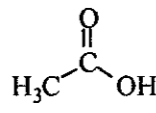
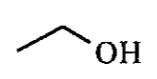
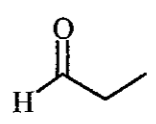
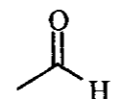
18 How many alkene products are possible in the following reaction?



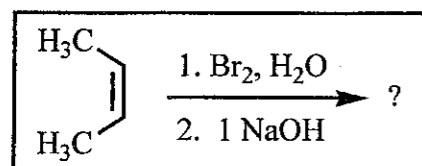
- A) None; cannot eliminate B) One
 C) Two D) Three
 E) Four

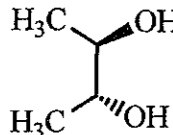
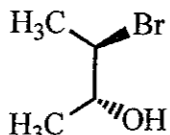
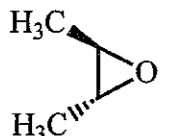
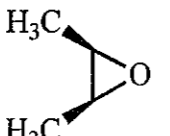
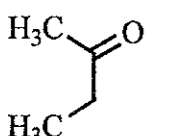
19 What would be the expected product in the following reaction?



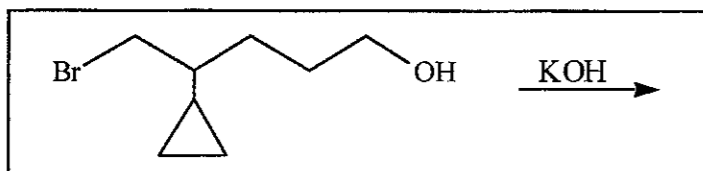
- A)  B) 
 C)  D) 
 E) 

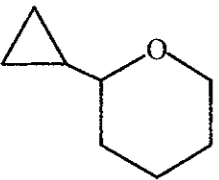
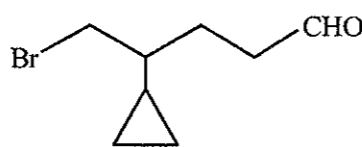
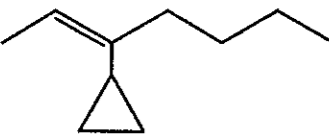
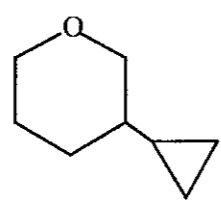
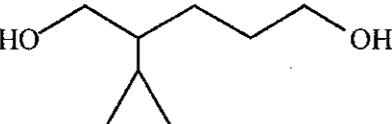
20 What product would result from the following reactions?



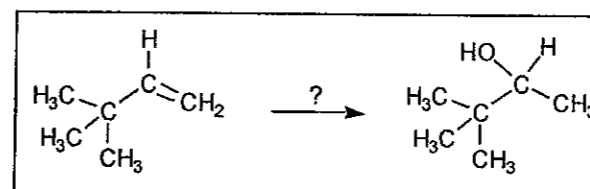
- A)  B) 
- C)  D) 
- E) 

21 Predict the MAJOR product of the following reaction:



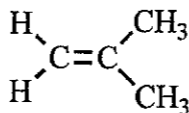
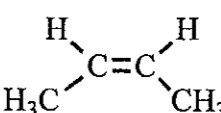
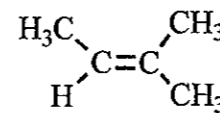
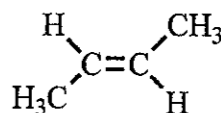
- A)  B) 
- C)  D) 
- E) 

22 Which reagents would be appropriate for the chemical transformation shown below?



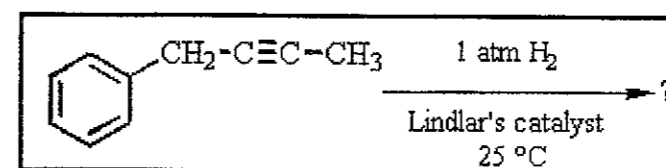
- A) $\text{H}_2\text{O}, \text{H}_2\text{SO}_4$ B) BH_3 , then $\text{H}_2\text{O}_2, \text{OH}^-$
 C) $\text{Hg}(\text{OAc})_2, \text{H}_2\text{O}$, then NaBH_4 D) $\text{NaBH}_4, \text{CH}_3\text{OH}$
 E) PCC

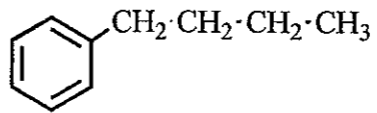
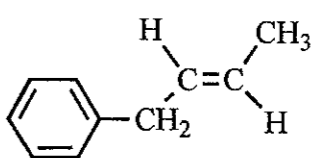
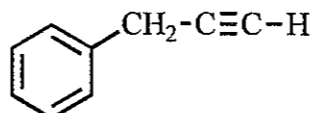
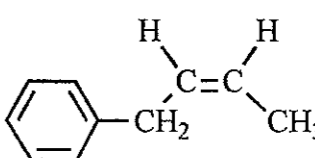
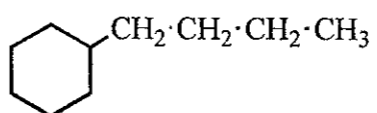
23 Reaction with ozone, followed by treatment with $(\text{CH}_3)_2\text{S}$, of which of the following would not yield **any** CH_3CHO ?

- A)  B) 
- C)  D) 

E) Both B and D

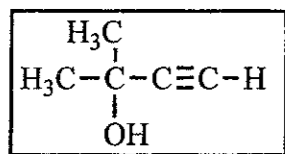
24 What would be the product of the following reaction?



- A)  B) 
- C)  D) 
- E) 

注意：背面尚有試題

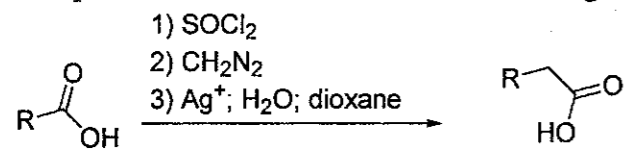
25 What would be the proper name of the following compound?



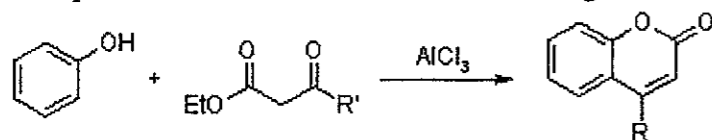
- A) 1,1-dimethyl-2-propyn-1-ol B) 3-methyl-1-butyn-3-ol
 C) 3-hydroxy-3-methyl-1-propyne D) 2-methyl-3-butyn-2-ol
 E) 2-ethynyl-2-propanol

II. Short answers questions (total 25 points)

26. Please provide the mechanism for the following reaction. (10 points)



27. Please provide the mechanism for the following reaction. (10 points)



28. Please provide the mechanism for the following reaction. (5 points)

