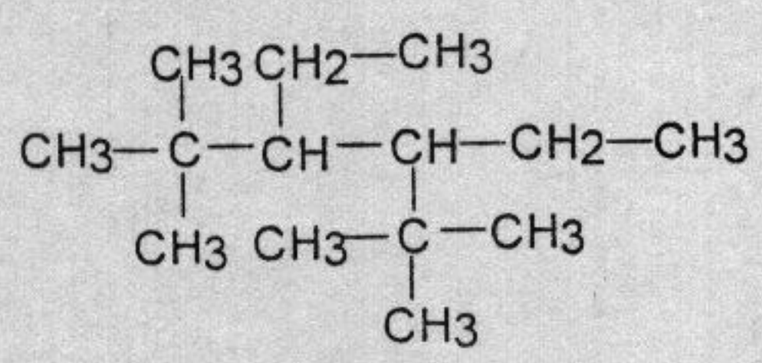
南京航空航天大学

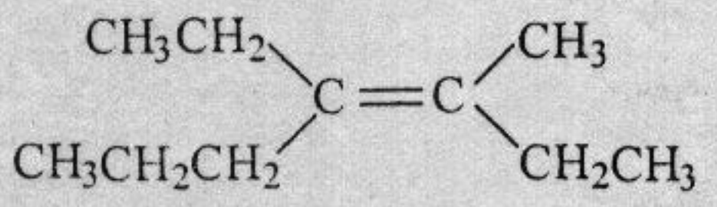
二 OO 四年硕士研究生入学考试试题

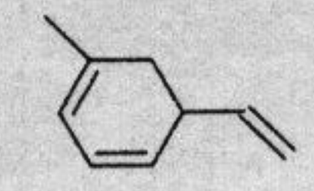
考试科目：有机化学

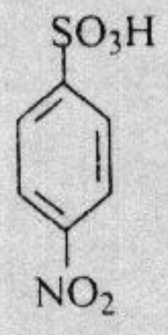
说　　明：答案一律写在答题纸上，写在试卷上无效

一、命名下列化合物（每题 1.5 分共 15 分）

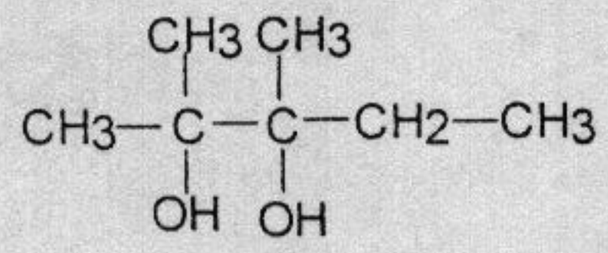
1. 

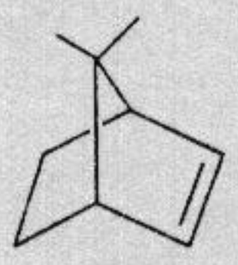
2. 

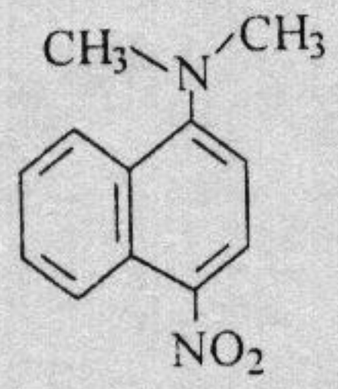
3. 

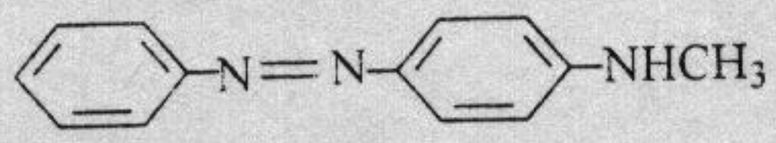
4. 

5. $CH_3CON(CH_3)_2$

6. 

7. 

8. 

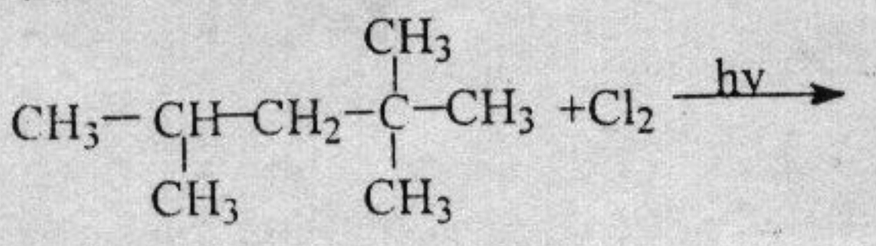
9. 

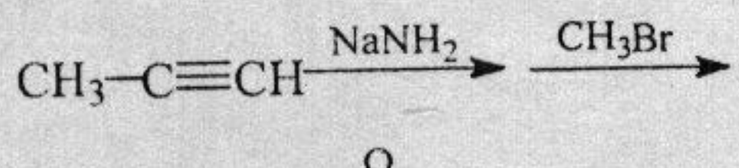
10. $CH_2{=}CHCOCH_2CH_3$

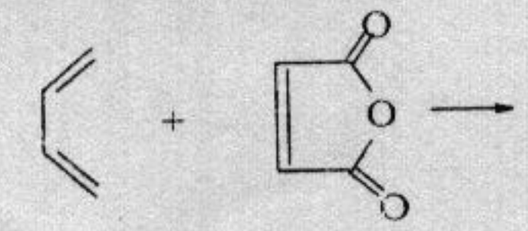
二、写出结构式（每题1.5分共15分）

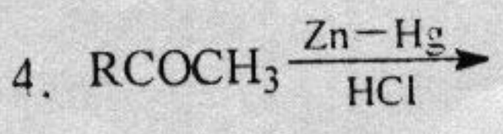
1. 异戊二烯
2. 螺[2,2]戊烷
3. 季戊四醇
4. 双酚A（2，2-(4,4’-二羟基二苯基)丙烷）
5. 草酸
6. 邻苯二甲酰亚胺
7. ε-己内酰胺
8. 光气
9. 四氢呋喃
10. 重氮甲烷

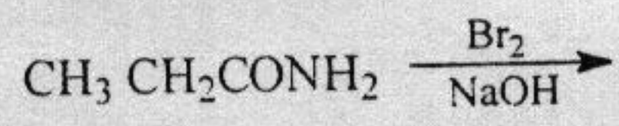
三、写出下列反应的主要产物（每题2分共40分）

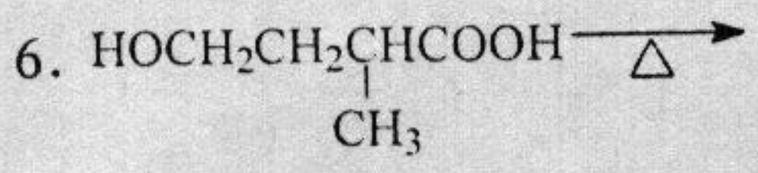
1. 

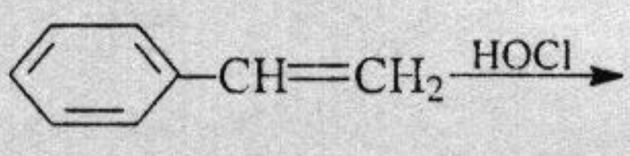
2. 

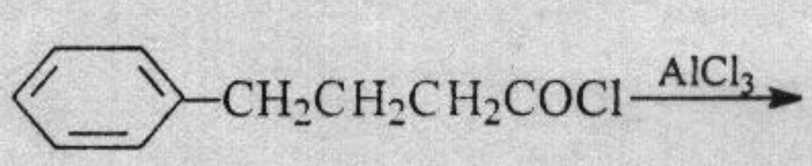
3. 

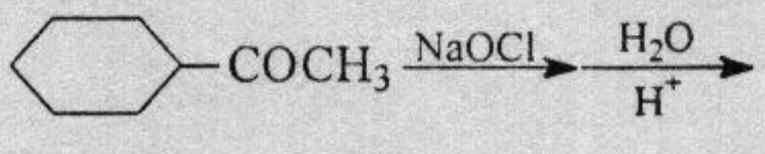
4. 

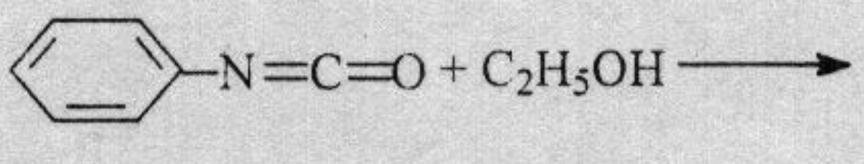
5. 

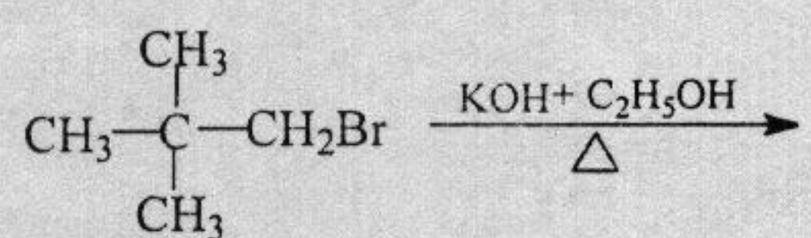
6. 

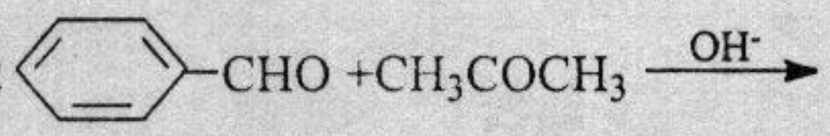
7. 

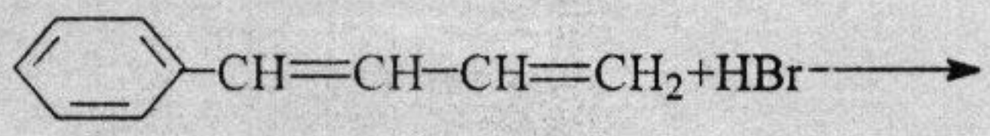
8. 

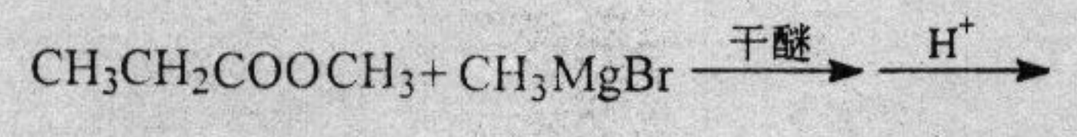
9. 

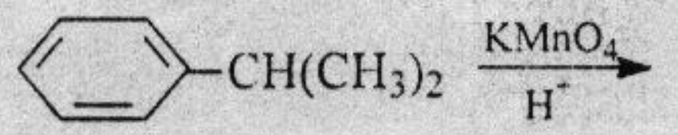
10. 

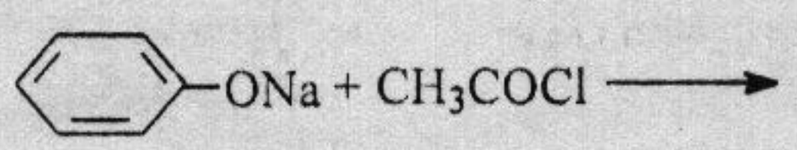
11. 

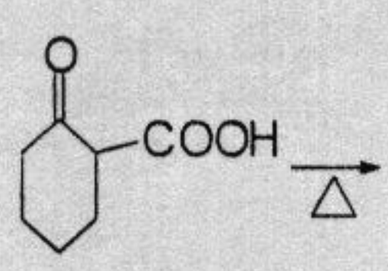
12. 

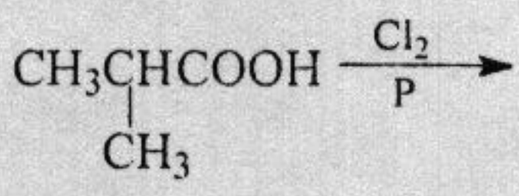
13. 

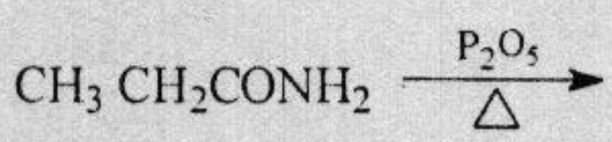
14. 

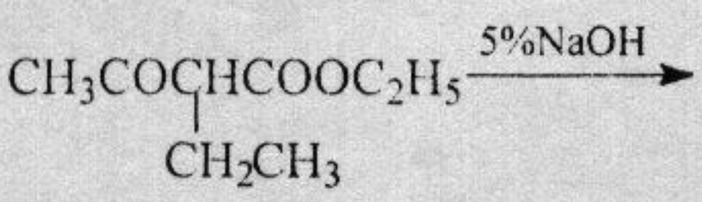
15. 

16. 

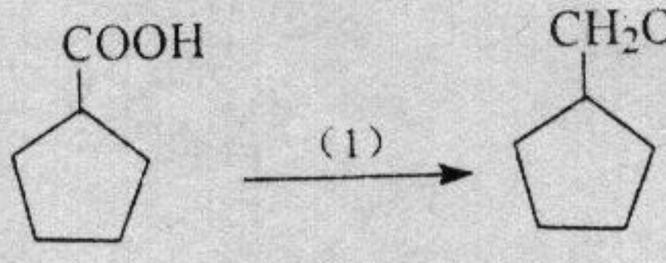
17. 

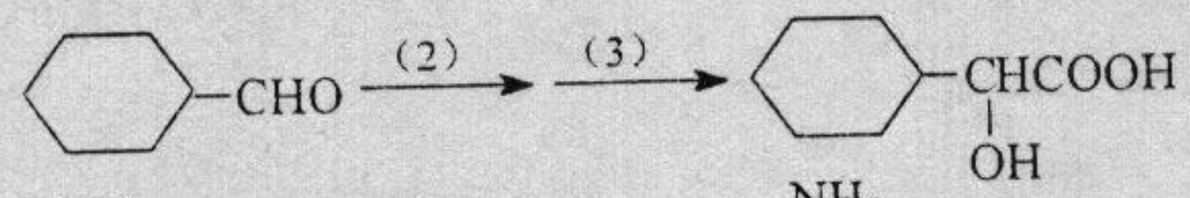
18. 

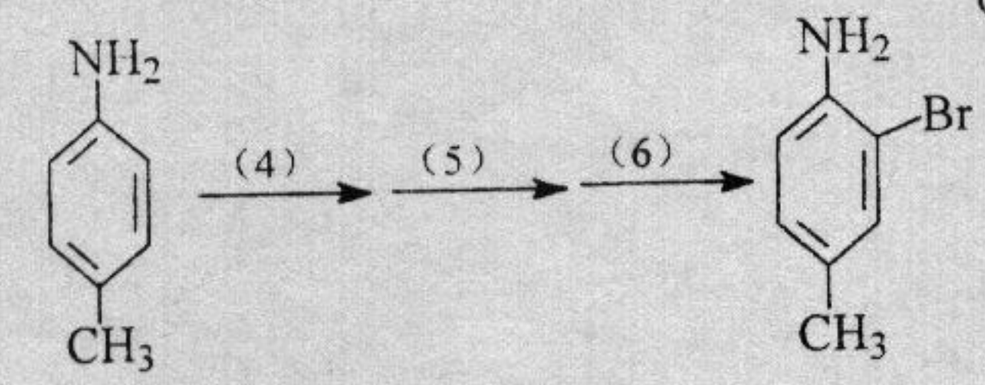
19. 

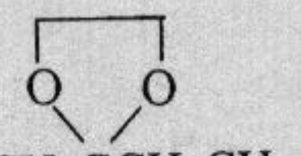
20. 

四、写出下列反应所需的试剂(每空1分共10分)

1. 

2. 

3. 

4. $CH_3CH_2MgBr + (7) \xrightarrow{\text{干醚}} \xrightarrow{H^+} \xrightarrow{(8)} CH_3COCH_2CH_3 \xrightarrow{(9)}$ 

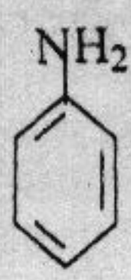
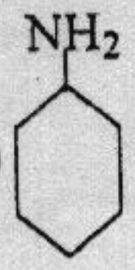
5. $CH_3-CH=CH_2 \xrightarrow{(10)} CH_3CH_2CH_2OH$

五、排序题（每题2分共10分）

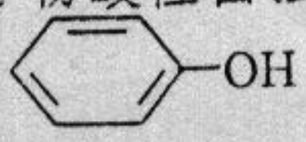
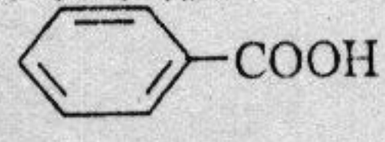
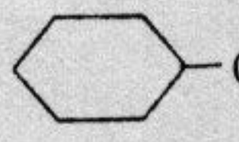
1. 化合物或离子碱性由强到弱顺序排列

(A) $CH_3CH_2NH_2$　(B)CH_3O^-　(C)CH_3COO^-　(D)NH_2^-

2. 化合物碱性由强到弱顺序排列

(A)  　(B)  　(C)NH_3　(D) 

3. 化合物酸性由强到弱顺序排列

(A)  　(B)  　(C)  　(D)H_2CO_3

4. 化合物酸性由强到弱顺序排列

(A)CH_3COOH　(B)HOOC-CH_2-COOH

(C)HOOC-COOH　(D)HCOOH

5. 化合物水解反应活性由强到弱顺序排列

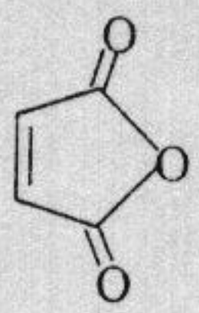
(A)CH_3COCl　(B)CH_3CONH_2

(C)$CH_3COO\,CH_3$　(D) $(CH_3CO)_2O$

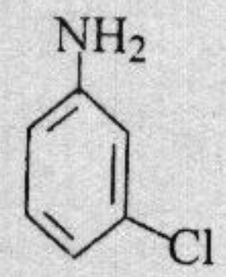
六、HCl 与 $CH_2=CH-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH_3$ 加成得到 $CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-\overset{}{\underset{}{CH}}-CH_3$，$CH_3-\overset{\overset{Cl}{|}}{\underset{\underset{CH_3}{|}}{C}}-\overset{}{\underset{}{CH}}-CH_3$

写出并解释每种产物形成过程。（10 分）

七、合成题（无机试剂任选）（每题 6 分共 36 分）

1. 乙醇为原料合成 

2. 乙炔为原料合成 $CH_3CH_2\underset{\underset{OH}{|}}{CH}\underset{\underset{OH}{|}}{CH}CH_2CH_3$

3. 甲苯为原料合成 

4. 乙烯为原料合成 $CH_3CH_2COCH_3$

5. 丙稀为原料合成 2－甲基戊烷

6. 丙二酸二乙酯与合适的有机试剂合成 $\begin{matrix}CH_2COOH\\|\\CHCOOH\\|\\CHCOOH\\|\\CH_2COOH\end{matrix}$

八、推断题（每题 7 分共 14 分）

1. 某二元羧酸 A（$C_8H_{14}O_4$）高温加热时转变为非酸化合物 B（$C_7H_{12}O$），B 用浓硝酸氧化时生成二元羧酸 C（$C_7H_{12}O_4$），加热时 C 生成酸酐 D（$C_7H_{10}O_3$）；用 $LiAlH_4$ 还原时，A 转化为 E（$C_8H_{18}O_2$），该 E 能脱水生成 3,4－甲基－1,5－己二烯，推断化合物 A、B、C、D、E 的结构。

2. 一未知酸 A（$C_9H_{10}O_3$）与 CrO_3-H_2SO_4 作用生成 B（$C_9H_8O_3$）。B 可发生银镜反应生成 C（$C_9H_8O_4$）,C 受热容易转变成 D（$C_8H_8O_2$）。A 用 $KMnO_4/H^+$氧化得苯甲酸。推断化合物 A、B、C、D 的结构。