

# 大同大學 102 學年度研究所碩士班入學考試試題

考試科目:有機化學

所別:化學工程研究所

第 1/2 頁

註:本次考試 不可以參考自己的書籍及筆記; 不可以使用字典; 不可以使用計算器。

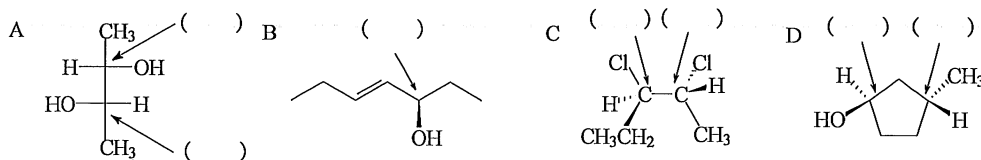
1) Draw the two chair conformers for each of the following, and explain which conformer is more stable:(10%)

(a) *trans*-1-ethyl-2-methylcyclohexane

(b) *cis*-1-ethyl-4-isopropylcyclohexane



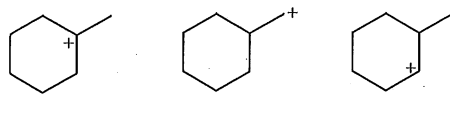
2) There are A-D compounds shown below. Indicate whether each of the following structures has the *R* or the *S* configuration: (10%)



3) Assign *E* or *Z* configurations to each alkene below. (4%)



4) Rank the carbocations below in order of increasing stability (least stable = 1; most stable = 3). Place the number corresponding to the carbocation's relative stability in the blank below the structure. (6%)

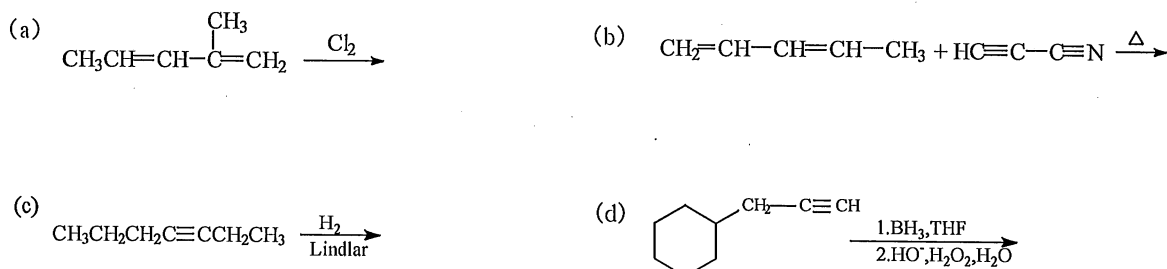


5) What will be the major product of the reaction of 2-methyl-2-butene with each of the following reagents? (10%)

- (a) HBr (b) Br<sub>2</sub>/H<sub>2</sub>O (c) Hg(O<sub>2</sub>CCH<sub>3</sub>)<sub>2</sub>, H<sub>2</sub>O followed by NaBH<sub>4</sub>  
 (d) Br<sub>2</sub>/CH<sub>3</sub>OH (e) H<sub>2</sub>/Pd

a	b	c	d	e
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6) Give the products of the following reactions, disregarding stereoisomers. (10%)



<背面繼續>

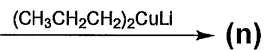
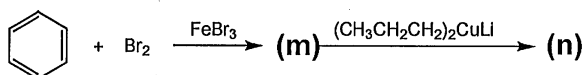
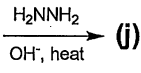
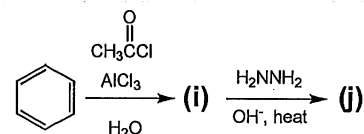
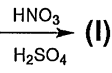
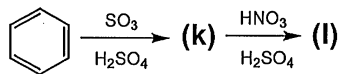
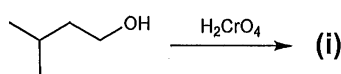
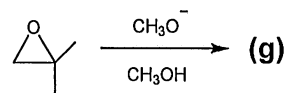
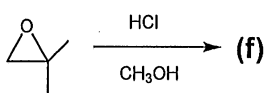
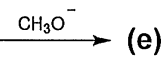
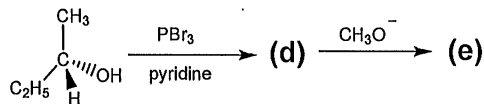
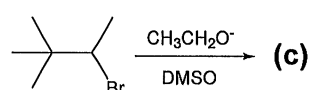
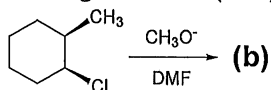
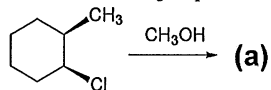
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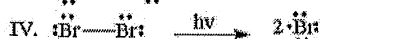
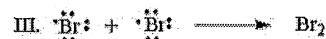
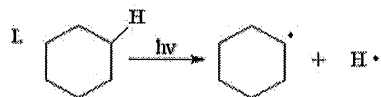
第 2 頁

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7. Give the major product of each of the following reactions: (28%)



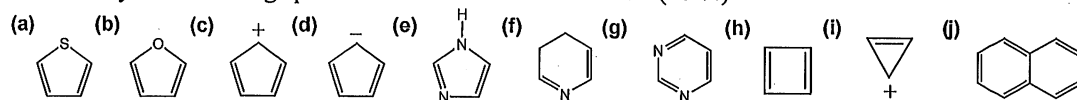
8. ( ) Which of the following is the initiation step for the monobromination of cyclohexane? (2 %)



9. Please rank the reactivity of the following alcohols which will react most rapidly with the Lucas reagent (HCl, ZnCl<sub>2</sub>)? (2 %)

(a) 2-butanol (b) 1-butanol (c) *tert*-butanol Ans: \_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_

10. Classify the following species as aromatic or nonaromatic (10 %)

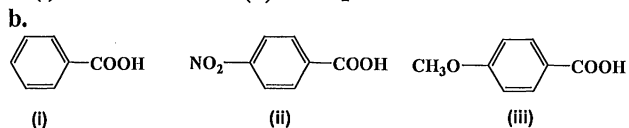


Aromatic: \_\_\_\_\_

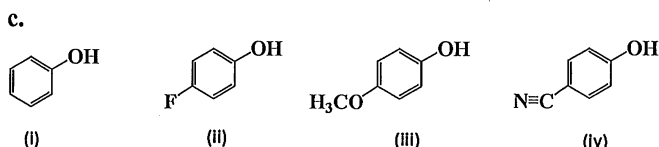
Nonaromatic: \_\_\_\_\_

11. Which of the compounds in each of the following pairs is more acidic? (2+3+3%)

a. (i) CH<sub>3</sub>COOH or (ii) ClCH<sub>2</sub>COOH Ans: \_\_\_\_\_ > \_\_\_\_\_



Ans: \_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_



Ans: \_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_