

國立高雄師範大學九十九學年度轉學生招生考試試題

系所別：化學系三年級

(以鉛筆作答者不予計分)

科目：有機化學（第一頁，共五頁）

※注意：不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上，於本試題上作答者，不予計分。

一、選擇題（每題5分，合計50分）

1. How many distinct triplets would you expect in the ^1H NMR of the compound below?

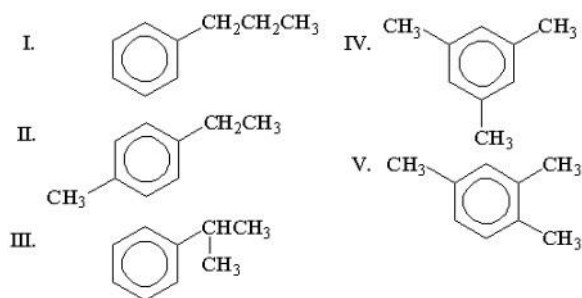
- (A)0 (B)2 (C)4 (D)6 (E)8



2. An unknown compound, C_9H_{12} , gave the following NMR spectrum:

Triplet at 1.21 ppm (3H) Singlet at 2.30 ppm (3H) Quartet at 2.60 ppm (2H) Singlet at 7.04 ppm (4H) What is the structure of the compound?

- (A)I (B)II (C)III (D)IV (E)V



3. Aromatic molecules contain _____ π electrons.

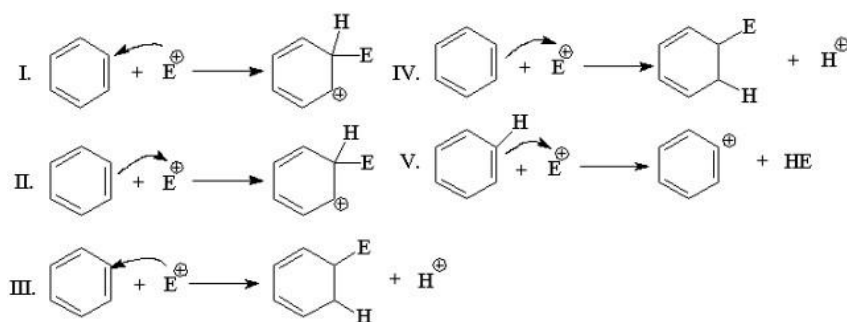
- (A) No (B) $4n+2$ (n is integer) (C) $4n+2$ (n is 0.5) (D) $4n$ (n is integer)
(E) unpaired

(背面有題 續翻背面)

科 目：有機化學 (第二頁, 共五頁)

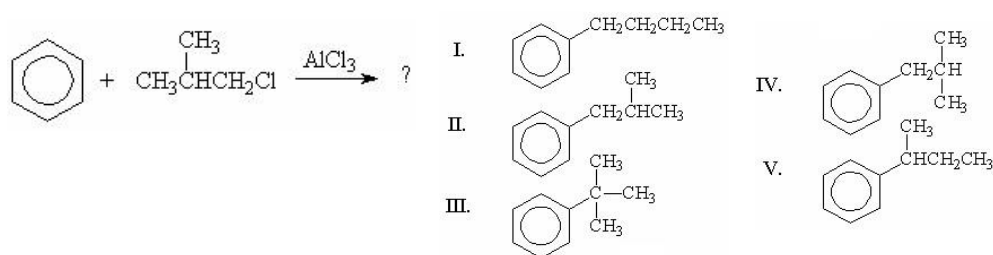
4. Which of the following is most likely to be the first step in the general mechanism for electrophilic substitution reactions?

- (A)I (B)II (C)III (D)IV (E)V



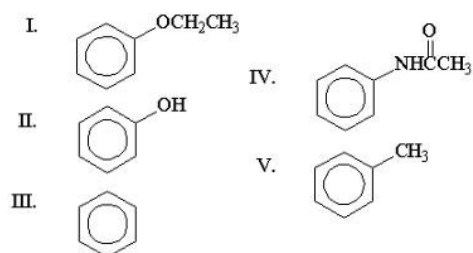
5. What is the major product of the following Friedel-Crafts alkylation?

- (A)I (B)II (C)III (D)IV (E)V



6. Which of the following compounds reacts most slowly during nitration?

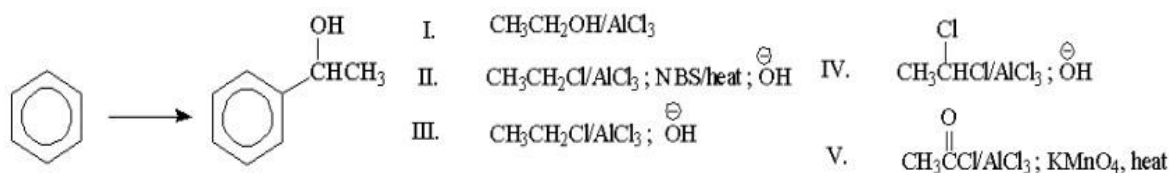
- (A)I (B)II (C)III (D)IV (E)V



科 目：有機化學 (第三頁, 共五頁)

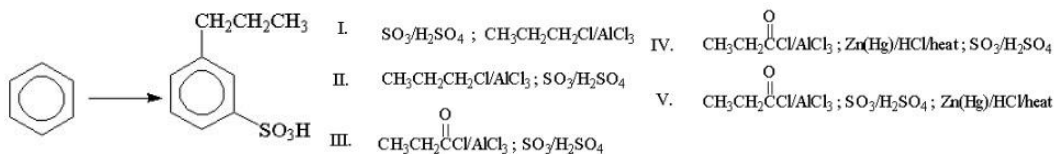
7. What is the best method for carrying out the following reaction?

- (A)I (B)II (C)III (D)IV (E)V



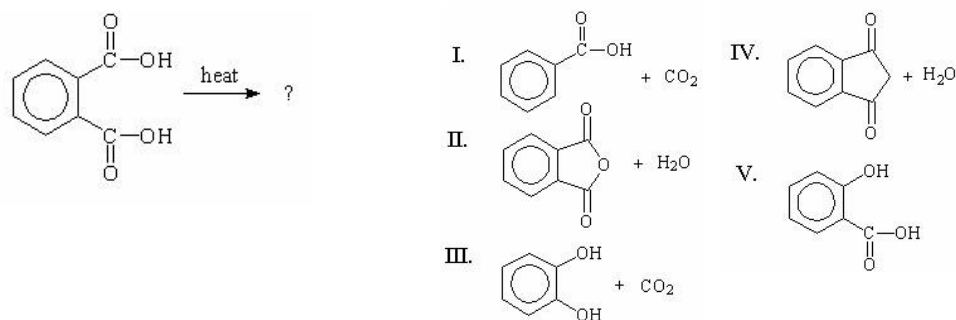
8. What is the best method for carrying out the following reaction?

- (A)I (B)II (C)III (D)IV (E)V



9. What is the major product of the following reaction?

- (A)I (B)II (C)III (D)IV (E)V

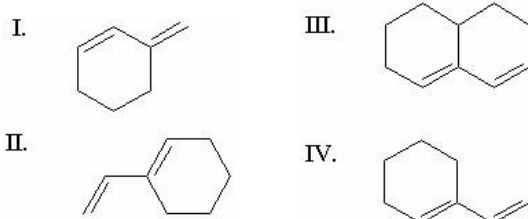


(背面有題 續翻背面)

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10. Which of the following conjugated dienes would not react with a dienophile in a Diels-Alder reaction?

- (A) I (B) II (C) III (D) IV (E) I and III



二、簡答題 (每小題 6 分, 合計 30 分)

(1) 寫出下列化合物的化學結構式

(A) neopentyl phenyl ether ; (B) p-divinylbenzene 與 (C) 5-allyl-1,3-cyclohexadiene

(2) 寫出 Lucas 試劑的化學組成並說明其如何鑑別 1°、2°或 3°醇的化學反應方法？

(3) 說明利用 IR 光譜吸收峰的差異性，鑑別下列異構物。

$\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$; $\text{CH}_3\text{CH}_2\text{NHCH}_3$ 與 $(\text{CH}_3)_3\text{N}$

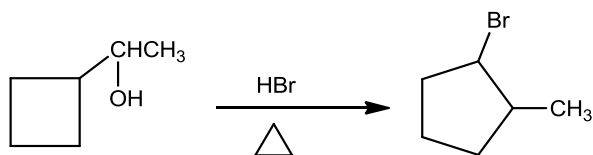
(4) 某有機物的分子式為 $\text{C}_{12}\text{H}_{16}\text{O}$ ，其光譜圖數據如下：

IR : 1659cm^{-1} (強吸收峰) ;

$^1\text{H NMR}$: $\delta 1.1(\text{s}, 9\text{H})$; $\delta 2.6(\text{s}, 2\text{H})$ 與 $\delta 7.2(\text{m}, 5\text{H})$,

請推導其正確化學結構式，簡述理由。

(5) 完成下列反應之反應機構



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(以鉛筆作答者不予計分)

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三、寫出下列化學反應主要產物的化學結構式 (每個“?” 答案各 2 分，合計 20 分)

