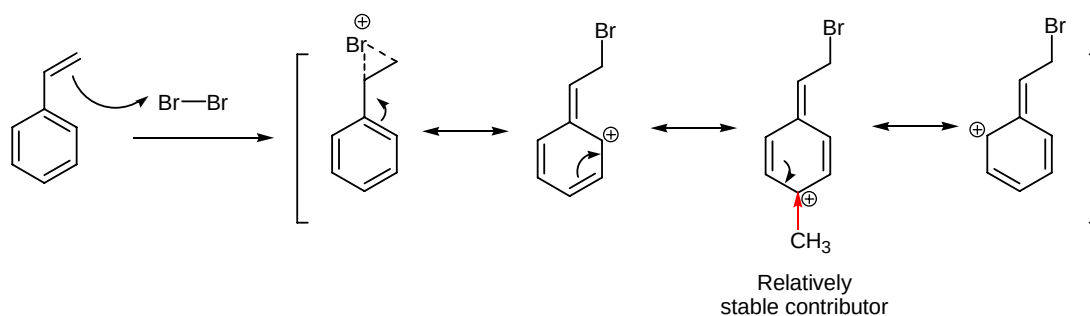


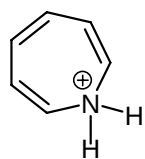
I. 1) Answer: (D)

推電子基可穩定反應中間體



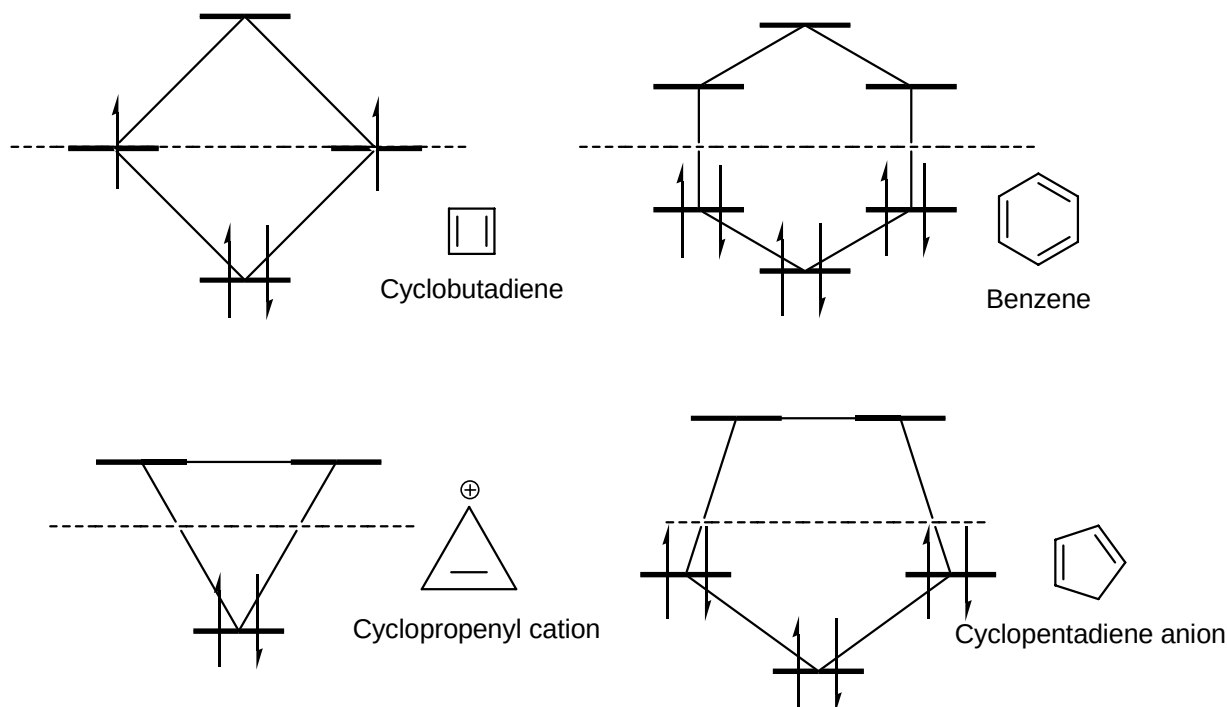
(參考課本 694 頁)

I. 2) Answer: (D)



雖有六個電子，但是 N 原子上已無空的 P 軌域可提供共振。

I. 3) Answer: (A)



(參考課本 633 頁；課本 635 頁，14.3 題；課本 638 頁，14.4 題；課本 638 頁，14.5 題)

I. 4) Answer: (C)

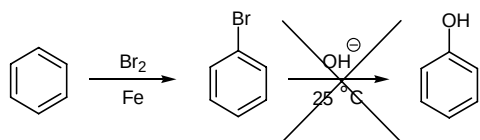
(A)產生最穩定的產物為 thermodynamic control

(B)kinetic control 反應路徑為最快的反應步驟；不一定是最少步驟

(C)正確

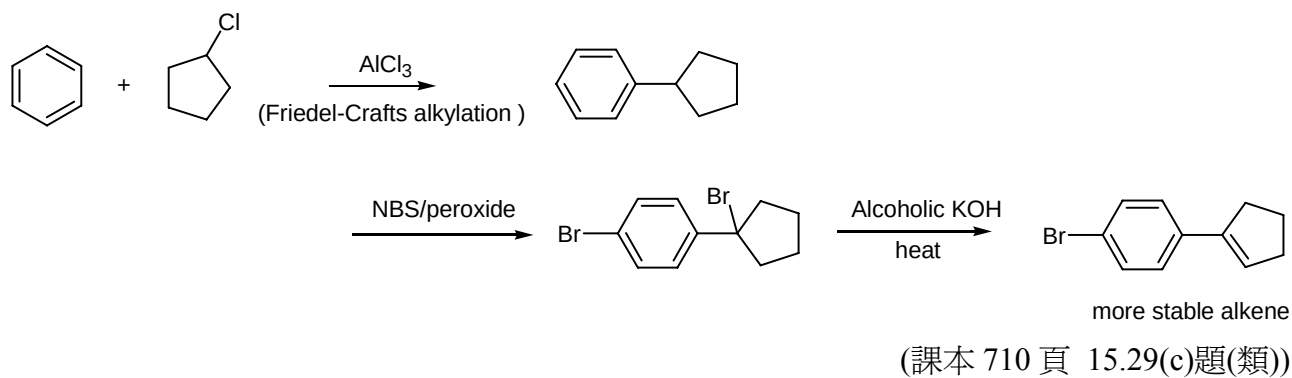
(D)不一定是最大位能的產物，是反應速度最快的產物

I. 5) Answer: (B)



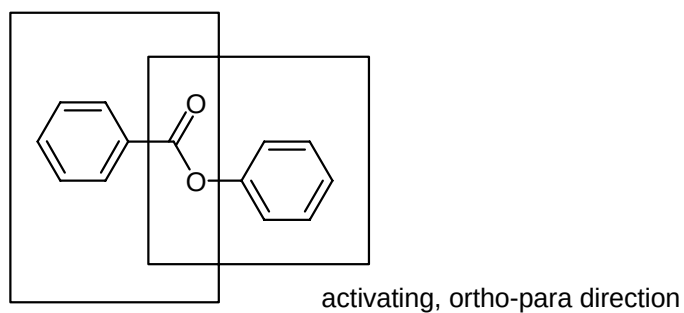
苯環上的鹵素無法在此條件下進行取代反應，需高溫。

I. 6) (B)



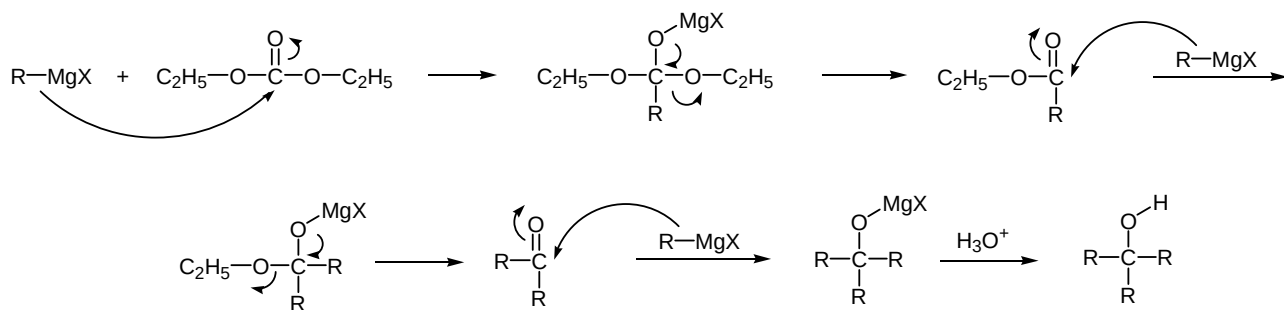
I. 7) (C)

deactivating, meta direction

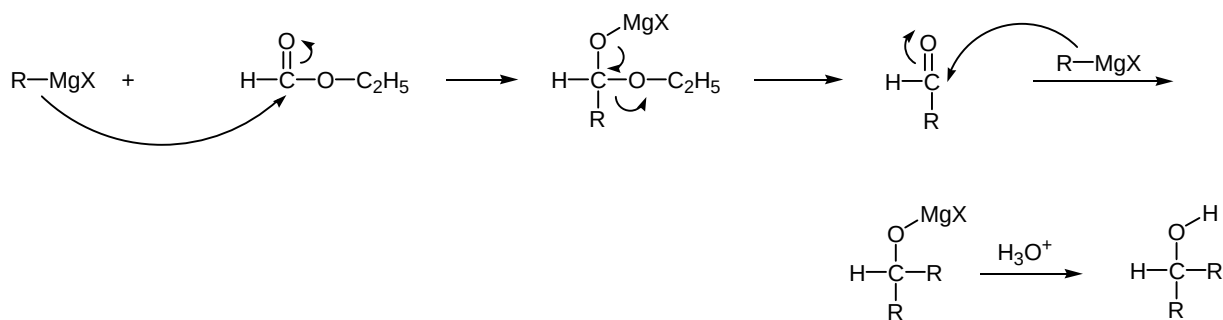


(課本 711 頁 15.35(b)題(類))

II. (a)

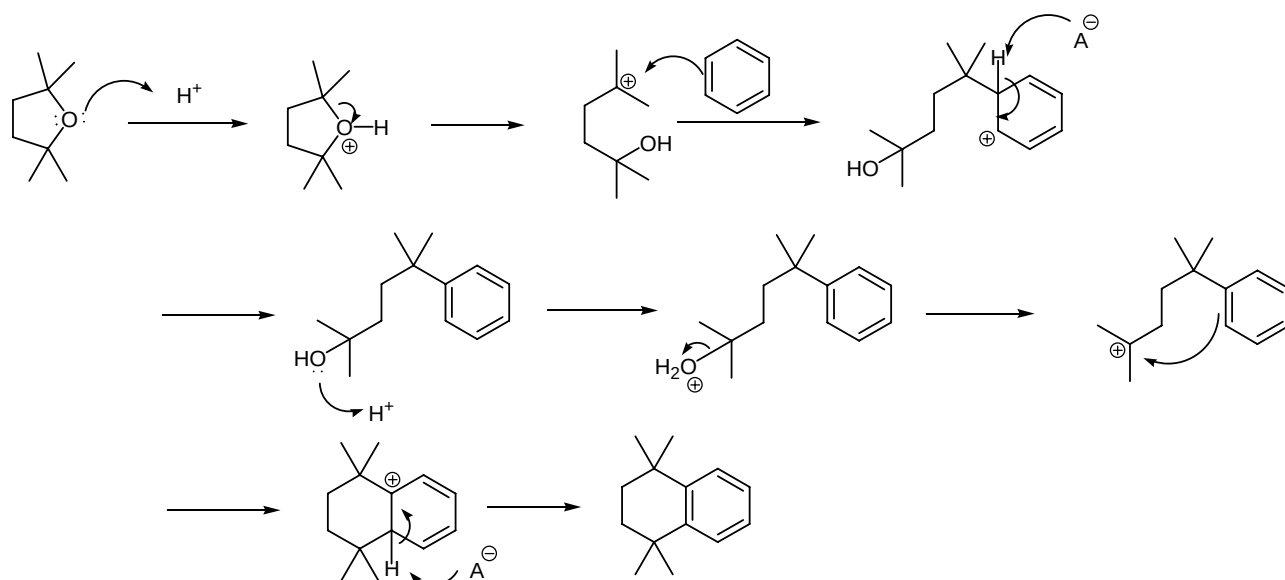


(b)



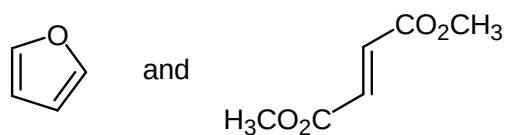
(課本 571 頁 12.25 題)

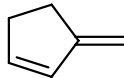
III.



(參考課本 672 頁，Friedel-Crafts alkylation 的反應機制)

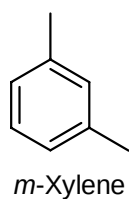
IV. (a)



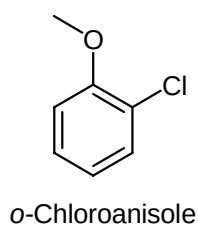
(b) 兩者皆不是 s-cis 構型的 diene。1,3-Butadiyne 是直線形；而  是 s-trans 構型。

(課本 613 頁 13.13 題(類)；課本 617 頁 13.25 題)

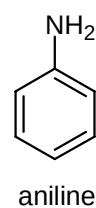
V. (a)



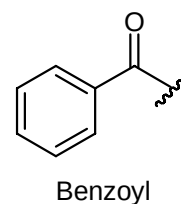
(b)



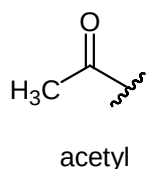
(c)



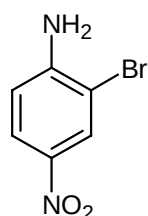
(d)



(e)

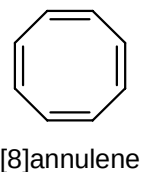


(f)

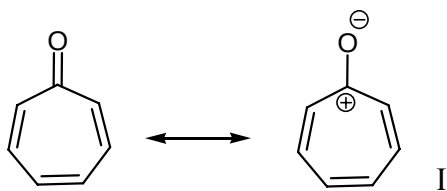


2-Bromo-4-nitroaniline

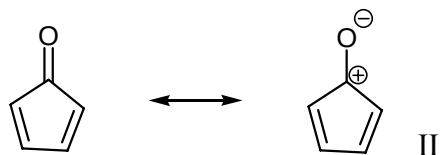
(g)



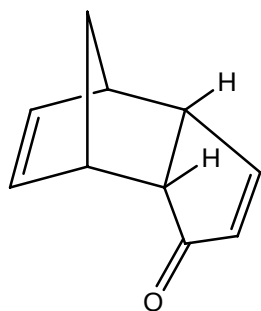
VI. (a) carbonyl group (C=O) 上的 O 原子為拉電子基，而七環上帶有一正電荷時，產生類似芳香性 cycloheptatrienyl cation 的穩定效果 (6 π electrons)，故化合物 I 較穩定



而化合物 II 上的形成類似的共振結構時，卻形成類似 antiaromatic cyclopentadienyl cation 的結構(4 π electrons)，使得穩定度變差。

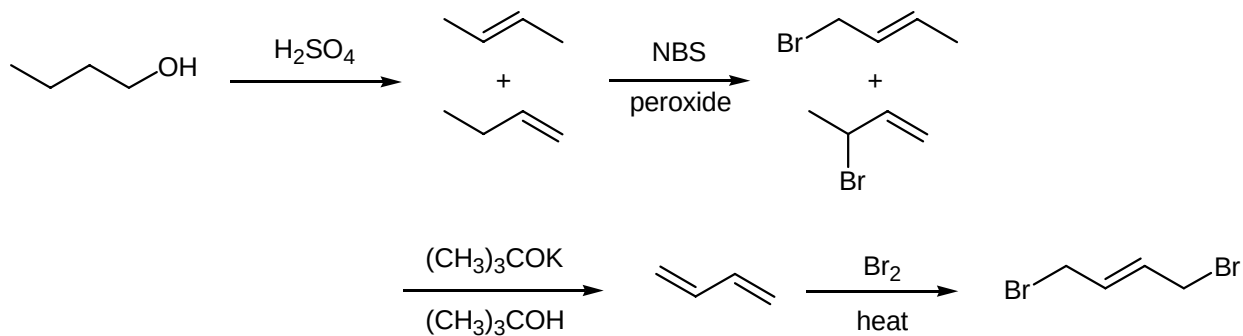


(b)

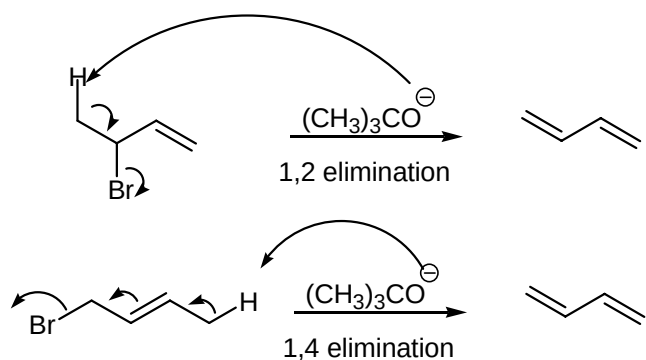


(課本 656 頁 14.21 題)8

VII.

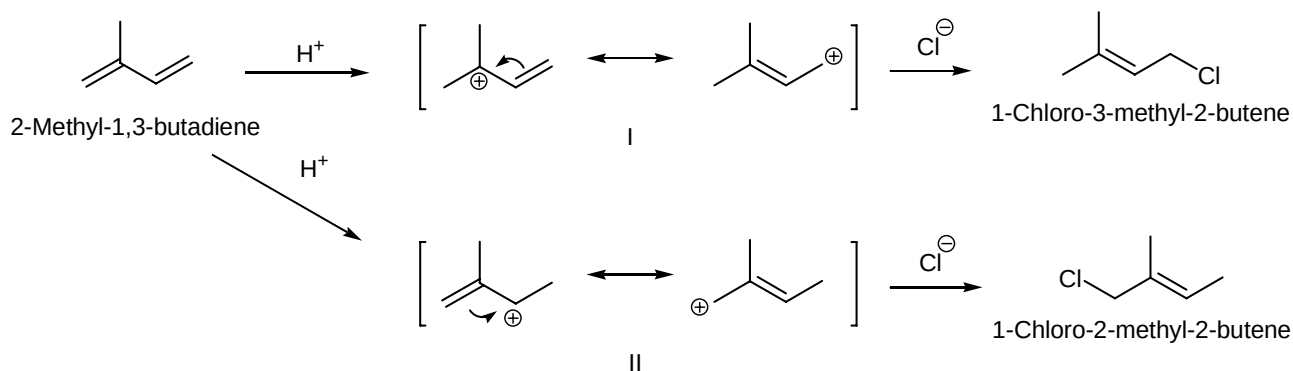


第三步中；



(課本 616 頁 13.19(c)題)

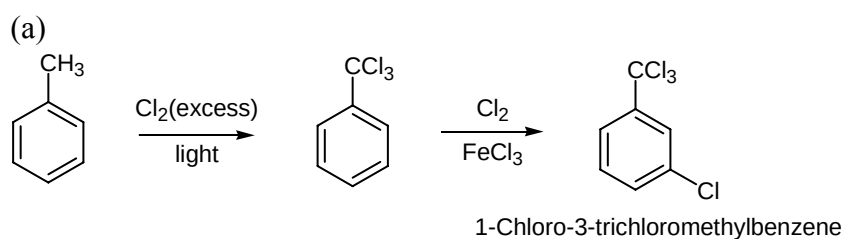
VIII.



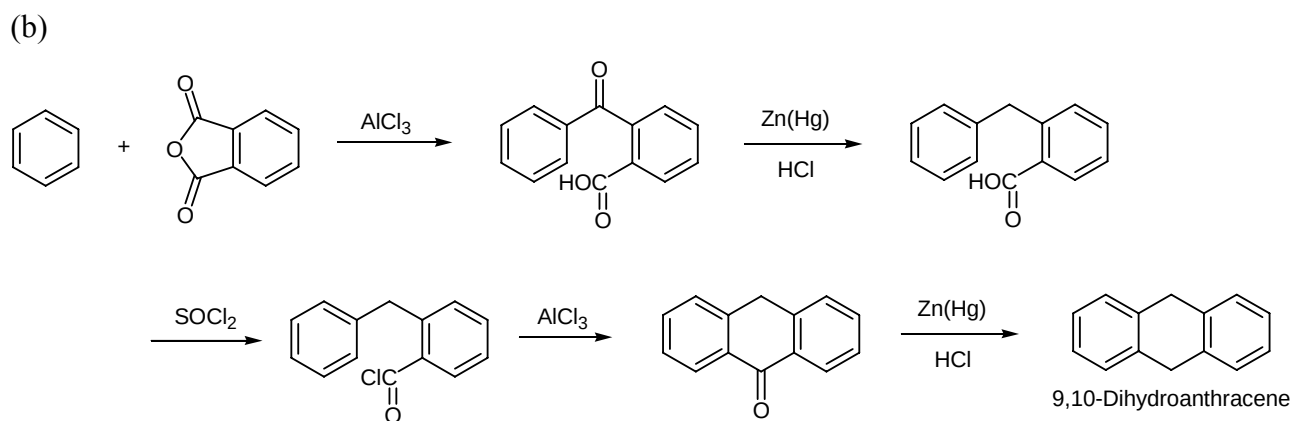
反應可經由 I、II 兩個共振式得到產物，而共振式 I 中因為有三級碳陽離子，相較於共振式 II 中的只有二級碳陽離子來的穩定，所以反應產物以 1-Chloro-3-methyl-2-butene 為主。

(課本 617 頁 13.23 題)

IX.



先將堆電子基的甲基轉換成拉電子基的-CCl₃，才可得到meta位置的氯取代物，兩步驟不能相反。



(課本 710 頁 15.31(e)題；課本 679 頁 15.7 題)