

等 別：四等考試
類 科：化學工程
科 目：有機化學概要
考試時間：1 小時 30 分

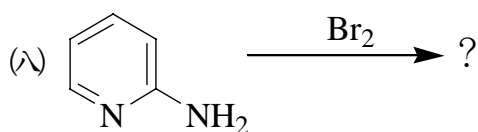
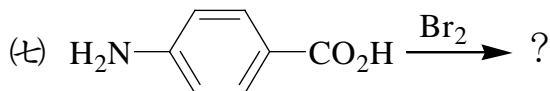
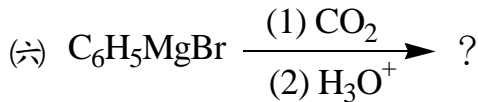
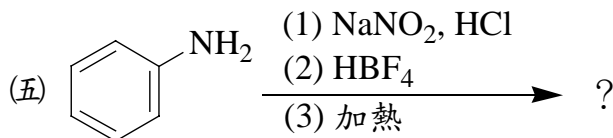
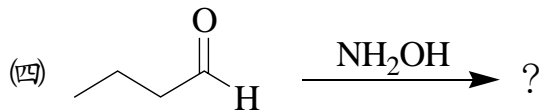
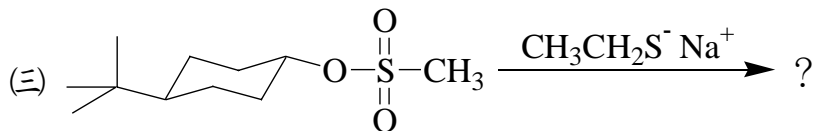
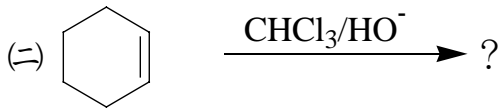
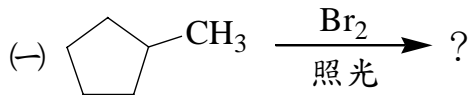
座號：_____

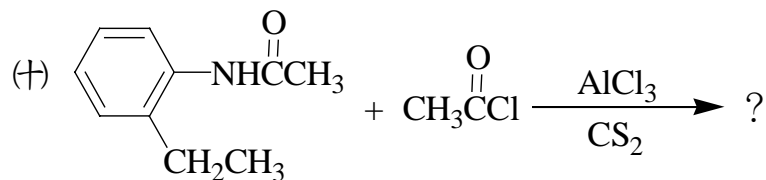
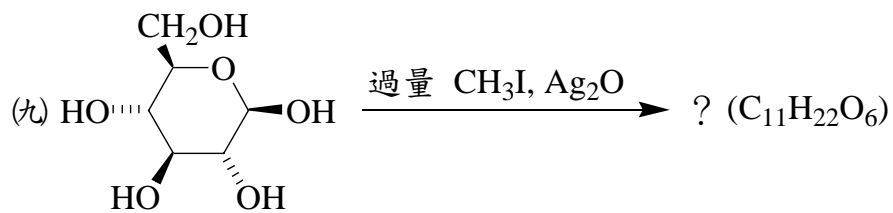
※注意：禁止使用電子計算器。

甲、申論題部分：(50 分)

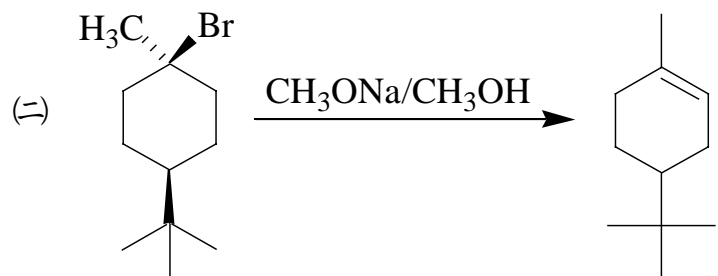
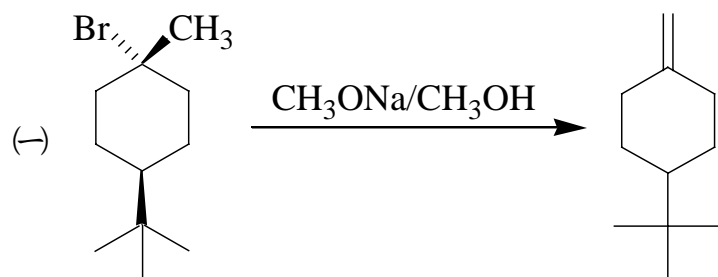
- (一)不必抄題，作答時請將試題題號及答案依照順序寫在申論試卷上，於本試題上作答者，不予計分。
(二)請以藍、黑色鋼筆或原子筆在申論試卷上作答。

一、寫出下列反應式主要產物的結構。(每小題 2 分，共 20 分)

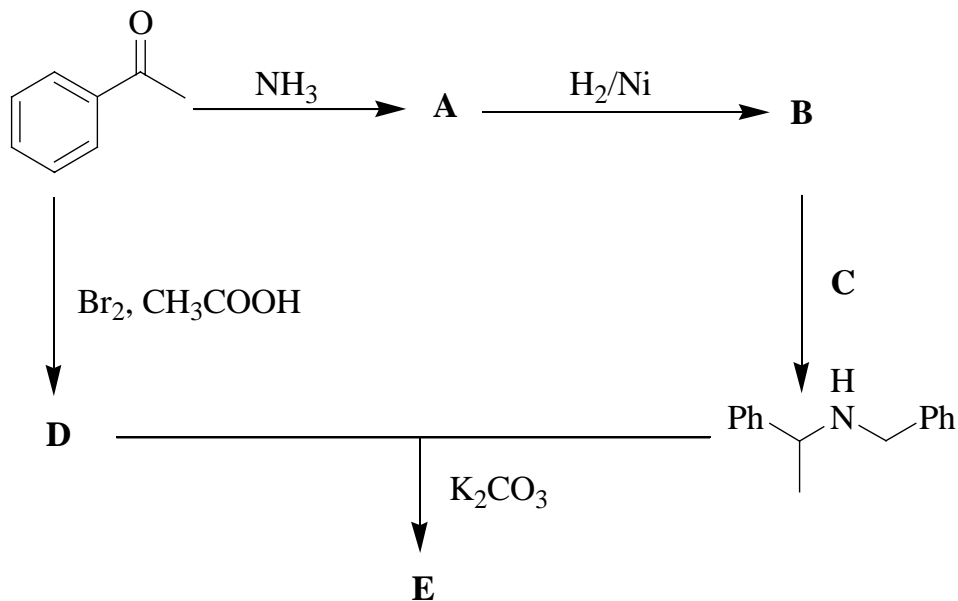




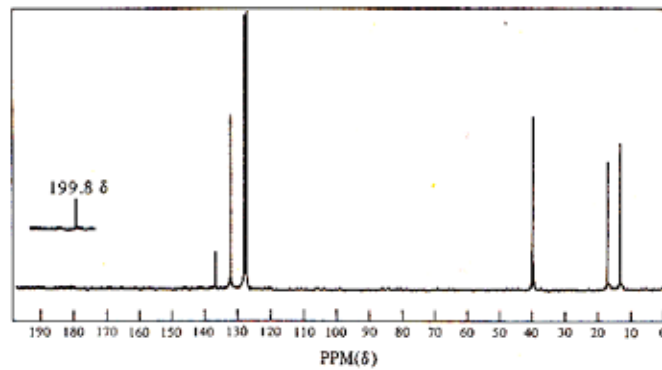
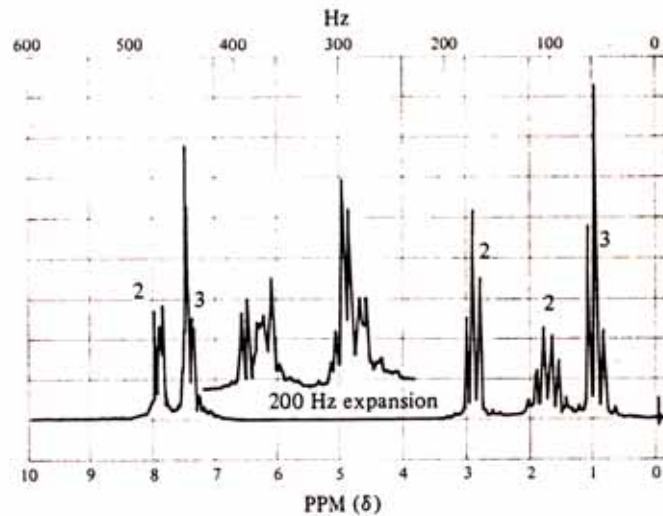
二、解釋以下之反應：（10分）



三、試寫出下列反應主要產物和試劑 A 至 E 的結構。（10分）



四、化合物A之分子式為 $C_{10}H_{12}O$ ，請根據氫核磁共振光譜及碳核磁共振光譜（ 1H -NMR及 ^{13}C -NMR）推斷分子結構，並說明推導過程。（10分）



乙、測驗題部分：（50分）

代號：3434

(一)本測驗試題為單一選擇題，請選出一個正確或最適當的答案，複選作答者，該題不予計分。

(二)共25題，每題2分，須用2B鉛筆在試卡上依題號清楚劃記，於本試題或申論試卷上作答者，不予計分。

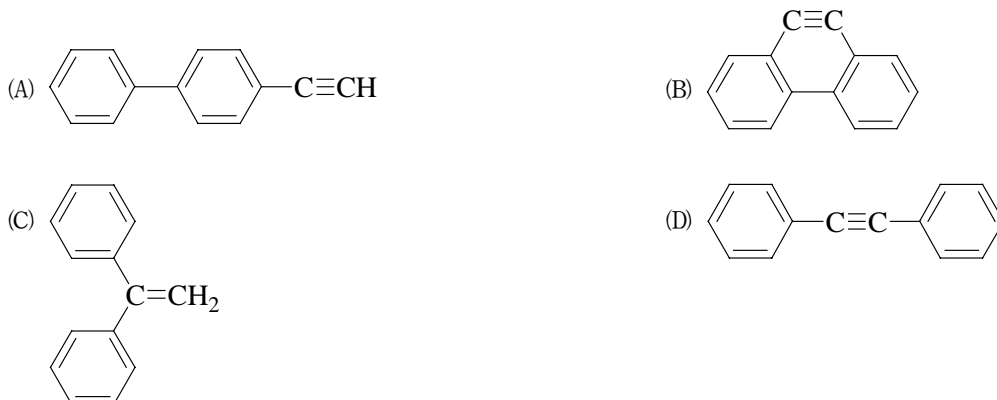
1 下列有關葡萄糖的性質敘述，何者正確？

- (A)葡萄糖是一種雙醣類 (B)葡萄糖含有酮基及羥基官能基
(C)葡萄糖可由麥芽糖在稀酸水溶液水解而得 (D)葡萄糖結構式為內消旋體，不具光學活性

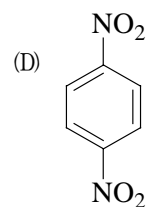
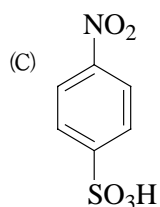
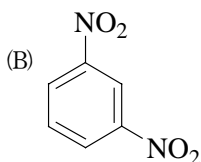
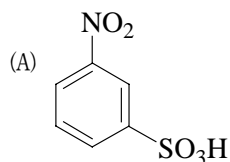
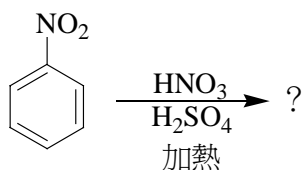
2 將醛式的赤藻糖（erythrose, $C_4H_8O_4$ ）還原，則產生：

- (A)一環狀的多元醇 (B)無光學活性物 (C)一對對映體 (D)三種物質的混合物

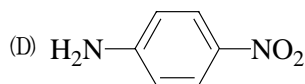
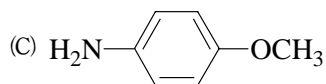
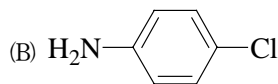
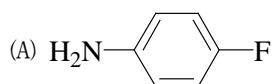
3 二苯乙炔的結構式為：



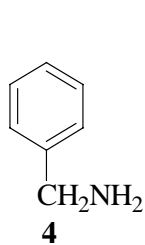
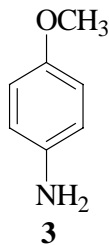
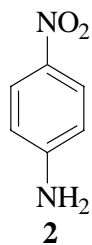
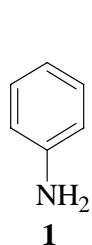
4 下列反應之主產物為：



5 2,4-二硝基氯苯 (2,4-dinitrochlorobenzene) 進行取代反應，下列化合物中何者與其反應最快？



6 依鹼性的降低 (由強到弱)，列序下列化合物：



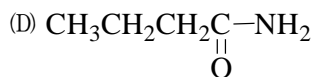
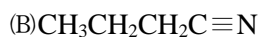
(A) 1 > 2 > 3 > 4

(B) 4 > 2 > 1 > 3

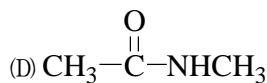
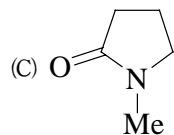
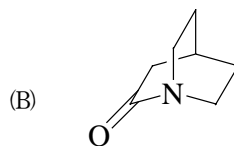
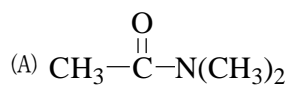
(C) 3 > 4 > 2 > 1

(D) 4 > 3 > 1 > 2

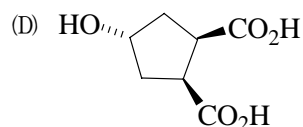
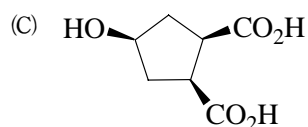
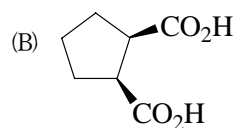
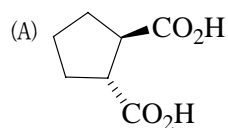
7 下列何者的紅外光譜在 2250 cm⁻¹處會有吸收？



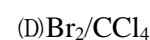
8 醯胺 (amide) 類之水解反應均需在較劇烈的條件下進行，下列化合物中何者在鹼性條件下之水解速率最快？



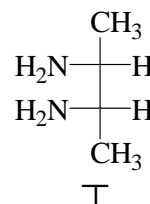
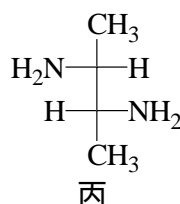
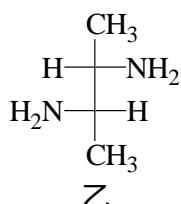
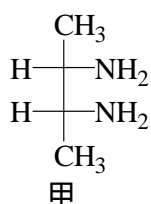
9 下列各化合物中何者具有旋光性？



10 下列何種試劑可用以區分 $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ 及 $\text{CH}_2=\text{CHCH}_2\text{NH}_2$ ？



11 甲、乙、丙、丁為 2,3-二氨基丁烷異構物的費雪投影 (Fischer projection)，下列有關敘述，何者錯誤？



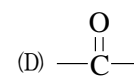
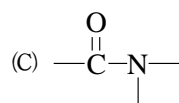
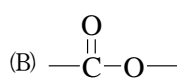
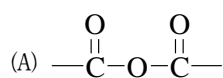
(A) 乙、丙為鏡像異構物 (enantiomers)

(B) 甲具光學活性

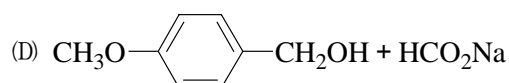
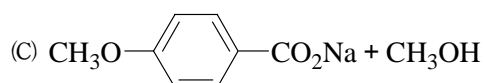
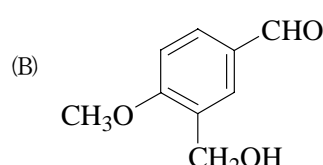
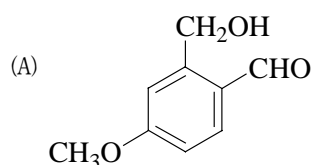
(C) 丙、丁為非鏡像異構物 (diastereomers)

(D) 甲、丁為相同化合物

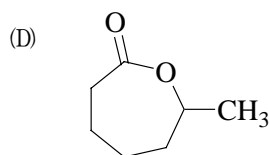
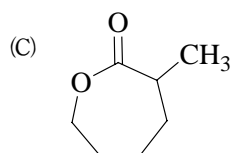
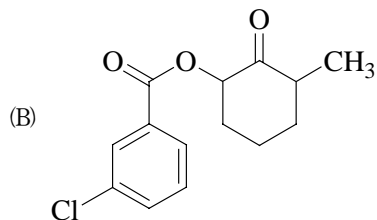
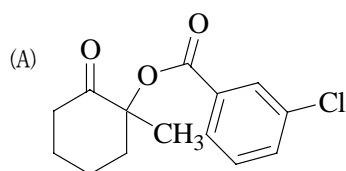
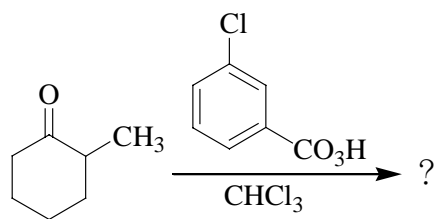
12 下列官能基中何者在紅外光譜中 $\text{C}=\text{O}$ 之伸張振動頻率最高？



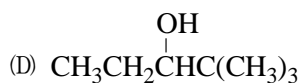
13 下列何者為 $\text{CH}_3\text{O}-\text{C}_6\text{H}_4-\text{CHO} + \text{HCHO} \xrightarrow{50\% \text{ NaOH}}$ 反應之產物？



14 下列所示反應的主要產物為：



15 下列醇類何者為三級醇？



16 下列試劑中何者可與醚類作用？



17 $\text{C}_4\text{H}_{10}\text{O}$ 有幾個醇類的同分異構物？

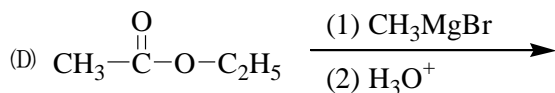
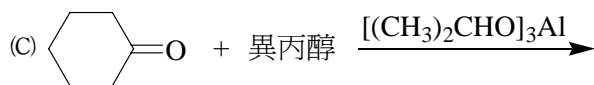
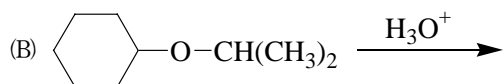
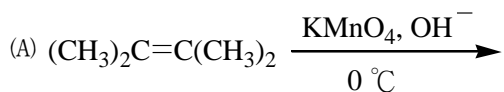
(A) 1

(B) 2

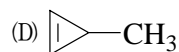
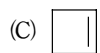
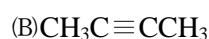
(C) 3

(D) 4

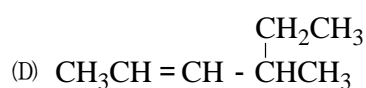
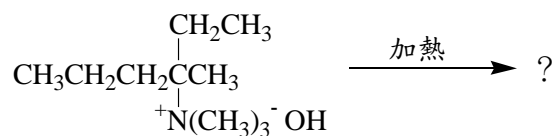
18 下列各反應何者可形成丙酮？



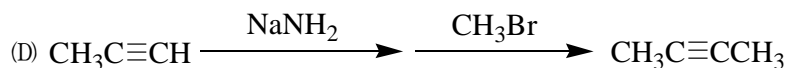
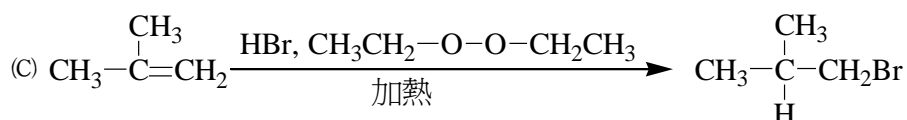
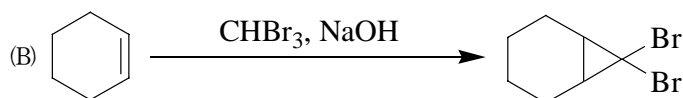
19 下列那一化合物與 $\text{H}_2\text{O}/\text{HgSO}_4/\text{H}_2\text{SO}_4$ 反應時會產生丁酮？



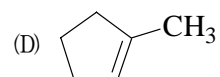
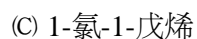
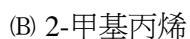
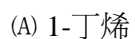
20 下列反應之主產物為何？



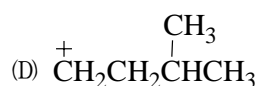
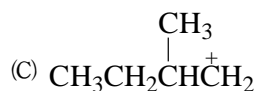
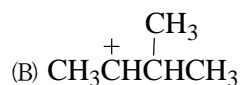
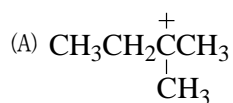
21 下列反應何者經由碳陽離子？



22 下列那一個化合物可進行順反異構化？



23 下列碳陽離子中，何者最穩定？



24 下列有機化合物的化學鍵何者的伸張振動頻率最高？

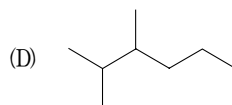
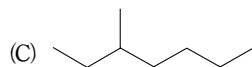
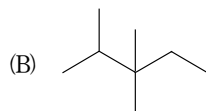
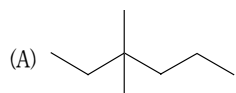
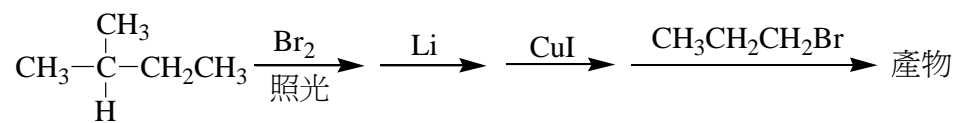
(A) C=N

(B) C-O

(C) C≡C

(D) C-H

25 在下列的反應過程，那一個是主要產物？



測驗題標準答案

考試名稱： 98年 特種考試地方政府公務人員考試

類科名稱： 化學工程(福建省連江區)

科目名稱： 有機化學概要（試題代號：3434）

題 數： 25題

標準答案：

題序	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
答案	C	B	D	B	C	D	B	B	A	D	B	A	D	D	C	D	D	C	B	C

題序	21	22	23	24	25
答案	A	C	A	D	A

備 註： 無更正紀錄。