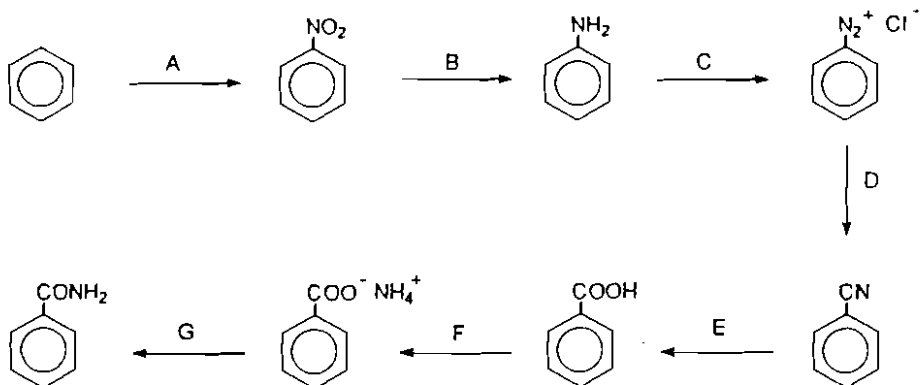
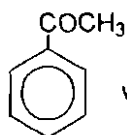


一、 Supply the suitable reagents for the following conversion. (2 pts. each; 20 pts. total)

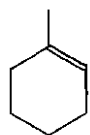


二、 Reactions. (3 pts. each; 30 pts. total)



with

- A. $\text{I}_2, \text{NaOH} \longrightarrow$
 B. $\text{NaCN}, \text{acid} \longrightarrow$
 C. excess $\text{CH}_3\text{OH}, \text{acid} \longrightarrow$
 D. $\text{NH}_2\text{NH}_2, \text{KOH}, \text{heat} \longrightarrow$



with

- E. $\text{OsO}_4 \longrightarrow$
 F. $\text{H}_2\text{SO}_4 \longrightarrow$
 G. $\text{Br}_2/\text{H}_2\text{O} \longrightarrow$
 H. $\text{HBr}, \text{peroxide} \longrightarrow$
 I. $\text{KMnO}_4, \text{base}, \text{heat} \longrightarrow$

三、 Explain/Define the following terms:(2 pts each; 10 pts total)

- (1) Beer's Law (2) Blind sample (3) Absorption (4) HETP
(5) Reversed-phase chromatography

四、 What is the purpose of a matrix modifier in atomic spectroscopy? (10 pts)

五、 The molar absorptivities of X and Y were measured with pure samples of each:
(5 pts each; 10 pts total)

	$\epsilon \text{ (M}^{-1} \text{ cm}^{-1}\text{)}$	
$\lambda \text{ (nm)}$	X	Y
$\lambda^1=406$	$\epsilon_{X^1}=720$	$\epsilon_{Y^1}=212$
$\lambda^2=457$	$\epsilon_{X^2}=479$	$\epsilon_{Y^2}=274$

A mixture of X and Y in a 1.0 cm cell had an absorbance of $A^1=0.722$ at 406 nm and $A^2=0.641$ at 457 nm. Find the concentrations of X and Y in the mixture.

六、 How do you confirm the accuracy of the analysis method? (10 pts)

七、 Briefly compare the LLE, SPE and SPME for the extraction liquid sample. (10