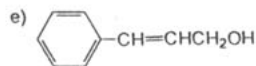
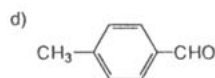
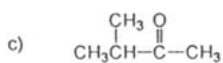
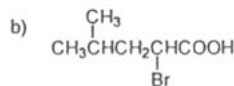
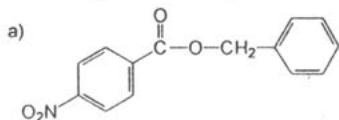


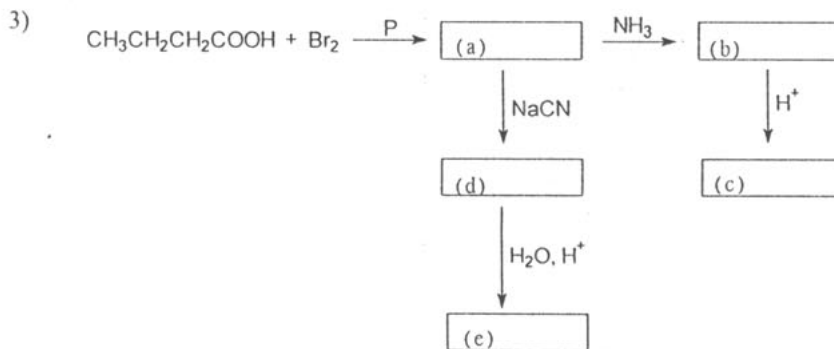
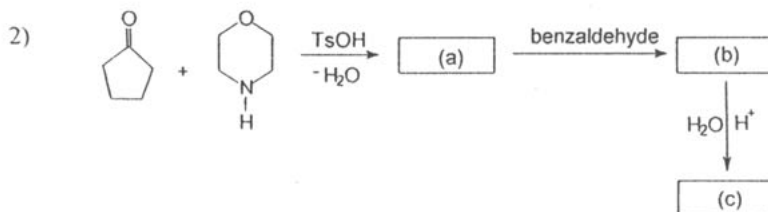
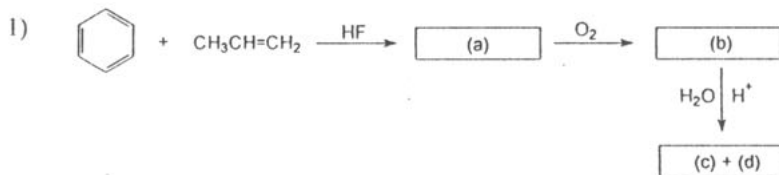
1. Explain the following terms: (15%)

- a) Hofmann rearrangement; b) Dipolar ion (Zwitterion); c) Reimer-Tiemann reaction;
d) Hofmann orientation; e) Reductive amination.

2. Name the following structures (IUPAC): (10%)

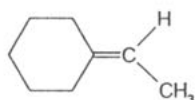


3. Complete the following reactions. (24%)



(背面仍有題目,請繼續作答)

4. Outline the synthesis of 4-amino-3-bromotoluene from toluene. (7%)
5. Outline the synthesis of α -methylvaleric acid [$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{COOH}$] from malonic ester and alcohols of three carbons or fewer. (7%)
6. Outline the synthesis of 3-methyl-2-pentanone from acetoacetic ester, benzene, and alcohols of four carbons or fewer. (7%)
7. How to characterize whether an amine is a) primary, b) secondary, or c) tertiary? (6%)
8. Write down the chemical equations for preparing the following compound from cyclohexanol and ethanol. (8%)



9. Complete the following equations. [(a): 2%, (b): 2%, (c): 12%]

