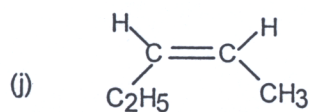
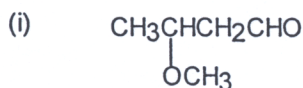
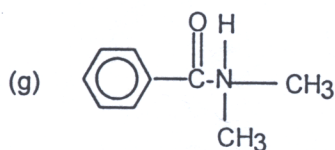
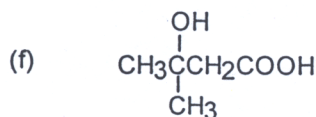
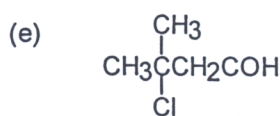
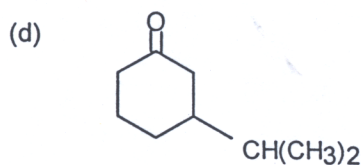
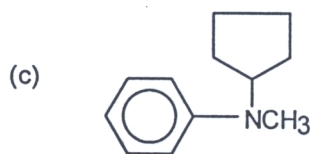
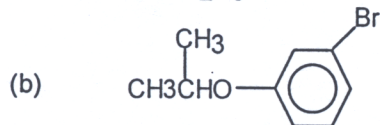
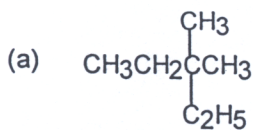
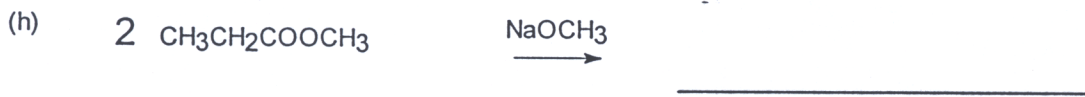
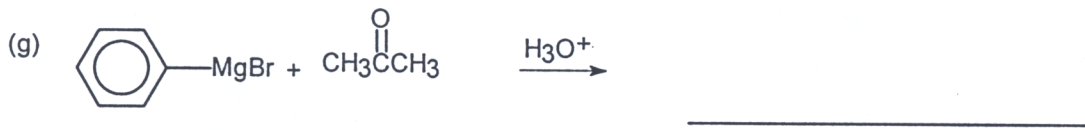
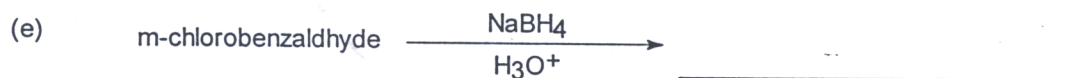
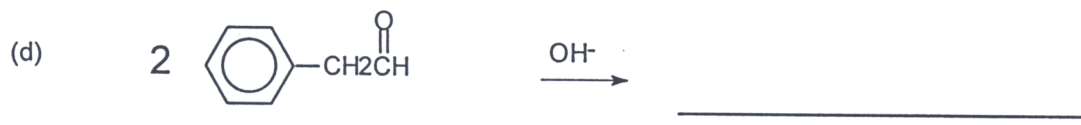
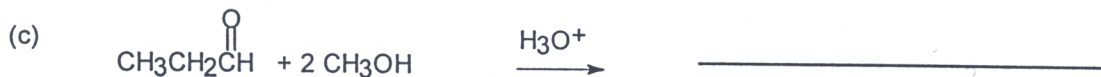
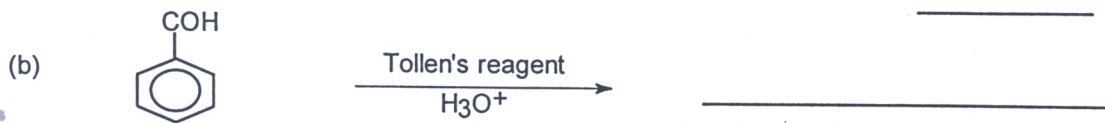


考生注意事項：所有考題務必在答案卷上作答。凡在問題卷上作答者無效。

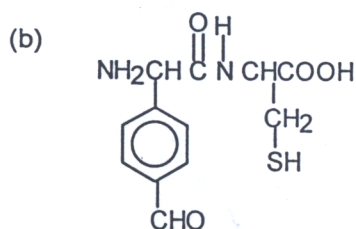
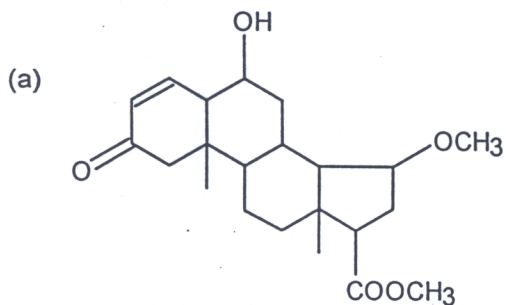
1. What are the IUPAC names of the following compounds ? (2 % each)



2. Write the structures of the major product of the following reactions (2 % each).



3. Please identify the functional groups of the following compounds and write down the name of functional groups. (5% each)



II. 選擇題 (單選, 每題二分, 答案錯倒扣0.5分)

___4. Which of the following compounds has the highest boiling point?

- (a) $\text{CH}_3\text{CH}_2\text{CH}_3$
- (b) CH_3OCH_3
- (c) CH_3CHO
- (d) CH_3COOH

___5. The compound $\text{CH}_3\text{CH}_2\text{CH}_2\text{-CO-NH-CH}_3$ is called :

- (a) 1-Methylpropanamide
- (b) N-Methylpropanamide
- (c) N-Methylbutanamine
- (d) N-Methylbutanamide

___6. In the body, reduction of a carbonyl groups is carried out by:

- (a) H_2
- (b) NaBH_4
- (c) NADH
- (d) ATP

___7. Which of the following describes the visible evidence for a positive Benedict's test?

- (a) A red-brown solution becomes clear.
- (b) A red precipitate forms from a blue solution.
- (c) A purple solution yields a brown precipitate.
- (d) A mirrorlike deposit forms from a colorless solution.

- ___ 8. Which of the following compounds gives an basic solution when it dissolved in water?
 (a) NH_4Cl
 (b) NaF
 (c) KNO_3
 (d) KCl
- ___ 9. Alkene and Alkyne reactions are typically known as:
 (a) substitution
 (b) addition
 (c) elimination
 (d) reduction
- ___ 10. Which of the following would you not expect to be a reaction of benzene?
 (a) chlorination
 (b) hydrogenation
 (c) sulfonation
 (d) nitration
- ___ 11. Oxidation of a tertiary alcohol will yield a(n):
 (a) aldehyde
 (b) ketone
 (c) carboxylic acid
 (d) no reaction
- ___ 12. Which of the following compounds would you expect to be able to react with an amine?
 (a) ammonia
 (b) carboxylic acid
 (c) methane
 (c) chloromethane
- ___ 13. What product is obtained from the oxidation of $\text{CH}_3\text{CH}_2\text{SH}$?
 (a) CH_3COH
 $\begin{array}{c} \text{||} \\ \text{S} \end{array}$
 (b) $\text{CH}_3\text{CH}_2\text{-S-CH}_2\text{-CH}_3$
 (c) $\text{CH}_3\text{CH}_2\text{-S-S-CH}_2\text{-CH}_3$
 (d) $\text{CH}_3\text{CH}_2\text{-S-S-H}$
- ___ 14. In NMR spectrum, the largest downfield shift will be exhibited by the proton or protons in which compound?
 (a) R-CH_3
 (b) $\text{R-CH}_3\text{O}$
 (c) $\text{R-CH}_2\text{-Cl}$
 (d) R-COOH
 (e) Ar-H

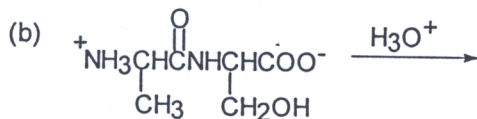
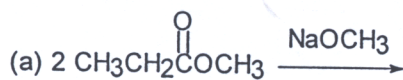
__15. What is the intermediate involving $\text{CH}_4 + 2 \text{Cl}_2 \xrightarrow{h\nu} 4 \text{CCl}_4$ reaction?

- (a) carbocation
- (b) carbanion
- (c) free radical
- (d) enol
- (e) diol

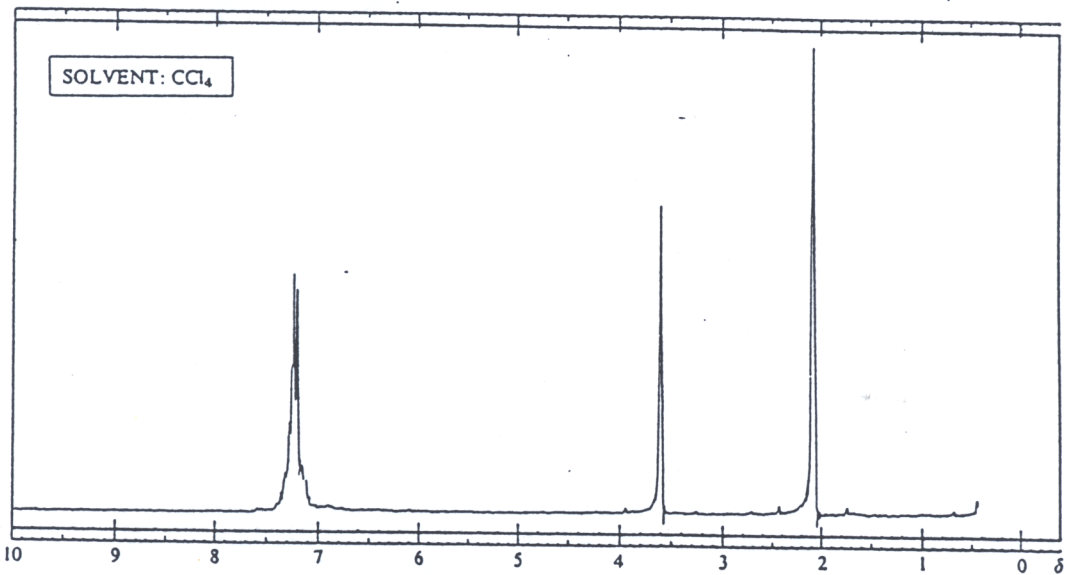
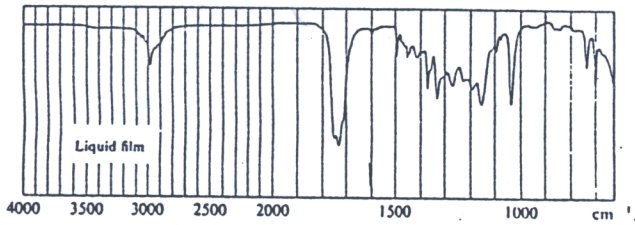
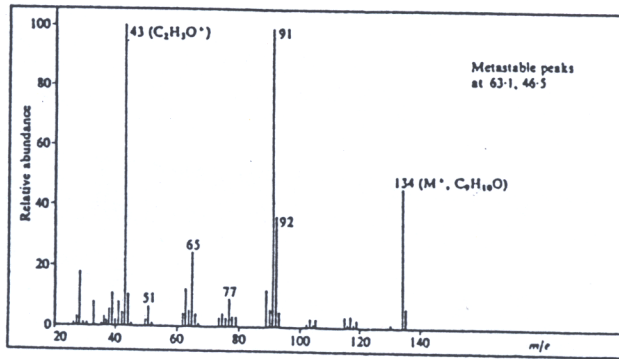
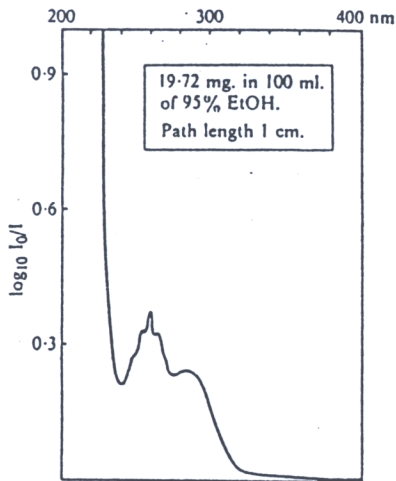
__16. Which of the following, on oxidation, yields a compound of formula $\text{C}_4\text{H}_8\text{O}$ that gives a negative result with Fehling's or Tollens' reagent?

- (a) $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$
- (b) $\text{C}_2\text{H}_5\text{CH}(\text{OH})\text{CH}_3$
- (c) $\text{C}_4\text{H}_9\text{OH}$
- (d) $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$
- (e) none of the above

17. Please write down the mechanisms of the following reactions (5% each).



18. Propose a structure for the compound based on the UV, IR, Mass, and NMR spectra, and explain what kind of structural informations from these spectra (10%)?



19. Show how you might distinguish between the following pairs of compounds by a simple chemical test. In each case, tell what test you would perform, what you would expect to observe and write an equation for each positive test (2 % each).

(a) butanoic acid and butanamide

(b) cyclohexanone and cyclohexanol