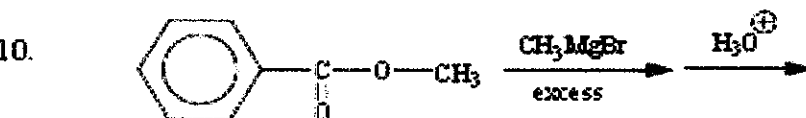
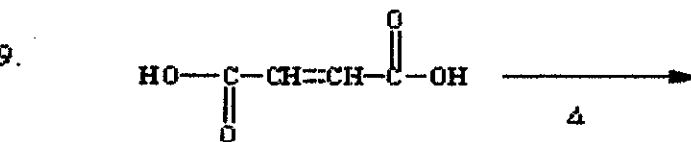
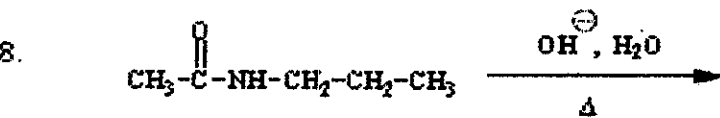
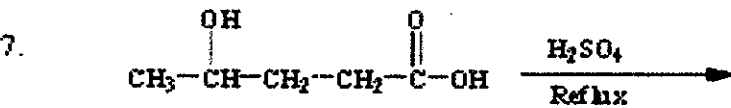
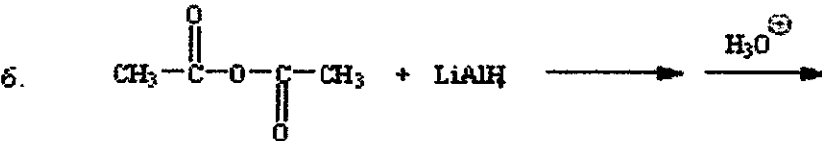
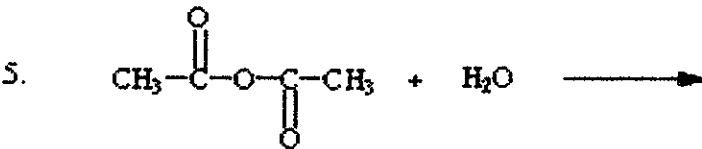
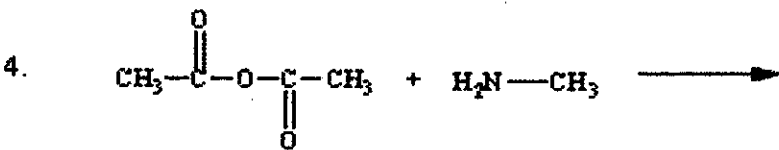
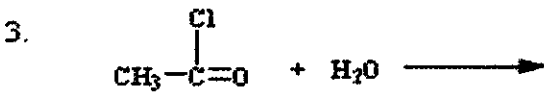
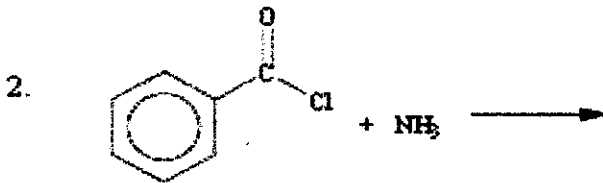
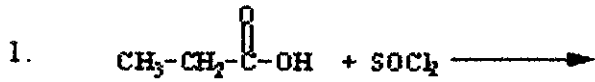
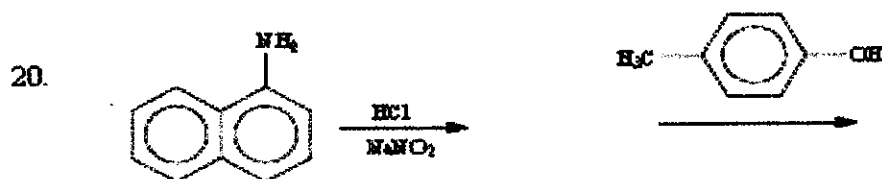
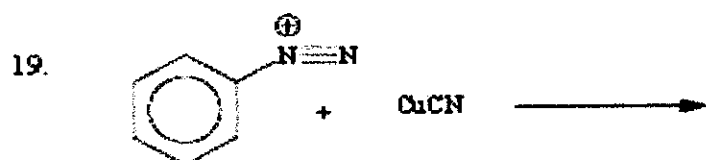
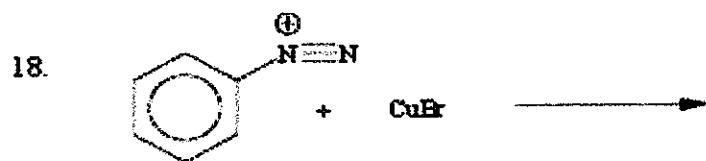
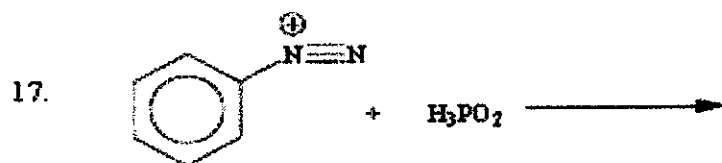
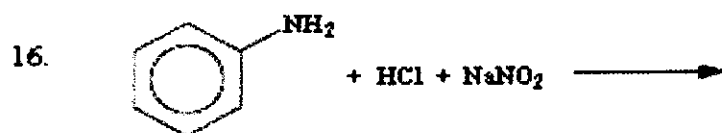
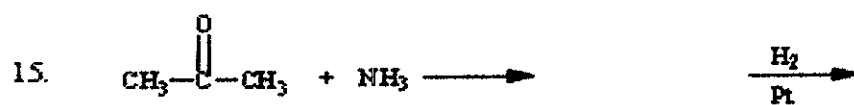
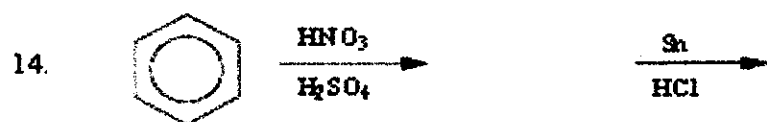
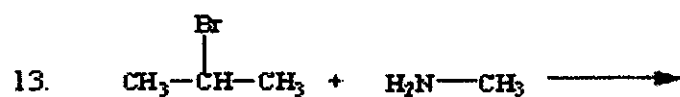
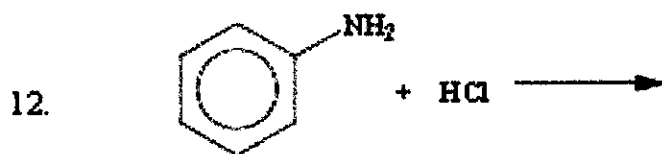
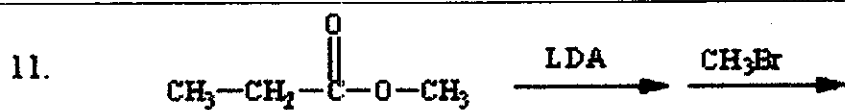
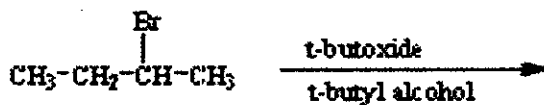


※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。(2 points for each)





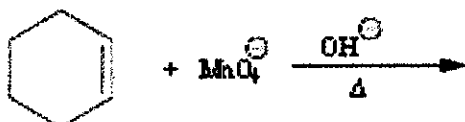
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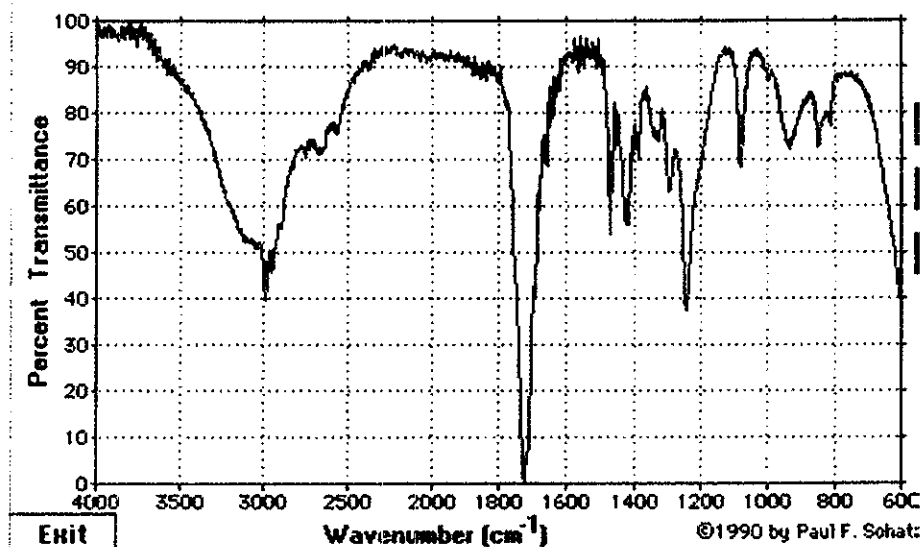
22.



23.



24. Below might be the spectrum of a carboxylic acid. Which two features make this likely?



- a. The broad peak above 3000 cm^{-1} and the sharp peak at 1710 cm^{-1}
- b. The peaks at 1240 and 1090 cm^{-1}
- c. The sharp peak at 3000 cm^{-1} and the sharp peak at 1240 cm^{-1}
- d. This is probably not the spectrum of a carboxylic acid.
- e. None of them

25. Which compound will reduce C=O but not C=C (at least not much)?

- a. Jones' Reagent
- b. PCC
- c. LiAlH_4
- d. NaBH_4

e. Chromic Acid

26. Which of these is not an oxidizing agent?

a. PCC

b. DIBAH

c. $\text{Na}_2\text{Cr}_2\text{O}_7$ in H_2SO_4

d. Jones' Reagent

e. Hypochlorite

27. Alkoxymercuration followed by borohydride reduction would be used to produce

a. an alcohol from an alkene.

b. an aldehyde from alcohol.

c. an acid from an alkyne.

d. an ether from an alkene.

e. an alkene from an aryl halide.

28. Which of the following is not a common reaction of aldehydes?

a. Nucleophilic acyl addition

b. Nucleophilic acyl substitution

c. alpha Substitution

d. Carbonyl condensation

e. Reduction to a ketone

29. When CN^- is reacted with carbonyl compounds followed by protonation of the oxygen, what do we call the products?

a. Cyanohydrins

b. Nitriles

c. Ketones

d. Imines

e. Enamines

30. In proton NMR, which compound or groups will show a characteristic peak near 10 ppm?

a. Alcohols

b. Aldehydes

c. Ketones

d. $\text{C}=\text{O}$

e. Methyl on a carbonyl

31. 2,4 DNP derivatives of carbonyl compounds are often made to
- make the compound soluble.
 - oxidize the compound.
 - confirm the identity of a compound by the MP of the derivative.
 - make the compound colored.
 - produce a Grignard reagent for further reaction.
32. How would you easily tell the difference between a proton NMR (^1H NMR) and a carbon (^{13}C NMR) spectrum?
- by looking at the size of the peaks
 - by looking at the location of the peaks
 - by looking at the horizontal scale
 - by looking at peak splitting
 - by looking for the internal standard peak
33. Hemiacetals and acetals are often found in
- carbohydrates.
 - proteins.
 - fats.
 - oils.
 - DNA.
34. Which is characteristic for the proton NMR pattern of diethyl ether?
- An upfield singlet and a downfield doublet.
 - An upfield triplet and a downfield quartet.
 - An upfield singlet and a downfield triplet.
 - Two upfield triplets on top of each other.
 - One downfield singlet.
35. Which of the following would be the most likely to undergo a nucleophilic aromatic substitution with hydroxide ion in normal conditions?
- Benzene
 - Chlorobenzene
 - Benzoic acid
 - p-Chlorotoluene
 - 2,4,6-Trinitro-1-chlorobenzene

36. Which is the only one of these compounds which cannot self-condense in the presence of dilute aqueous alkali?

- a. Phenylethanal
- b. Propanal
- c. 2-Methylpropanal
- d. 3-Methylpentanal
- e. 2,2-Dimethylpropanal

37. Which of the following compounds would be the strongest acid?

- a. $\text{CHF}_2\text{CH}_2\text{CH}_2\text{COOH}$
- b. $\text{CH}_2\text{FCHFCH}_2\text{COOH}$
- c. $\text{CH}_3\text{CF}_2\text{CH}_2\text{COOH}$
- d. $\text{CH}_3\text{CH}_2\text{CF}_2\text{COOH}$
- e. $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

38. The IR spectrum of a compound exhibits a broad absorption band at $2500\text{-}3000\text{ cm}^{-1}$ and a sharp band at 1710 cm^{-1} . Which of these compounds could it be?

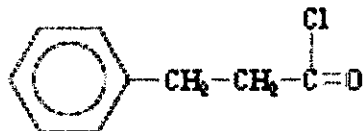
- a. 1-Butanol
- b. Propyl acetate
- c. Butanoic acid
- d. Acetyl chloride
- e. Acetic anhydride

39-44. Write structures for the compounds shown below:

- 39. meta-bromophenol
- 40. o-aminobenzoic acid
- 41. phenanthrene
- 42. 3-methyl-2-phenylhexane
- 43. benzyl alcohol
- 44. para-xylene

45-50. Name the compounds whose structures are shown below

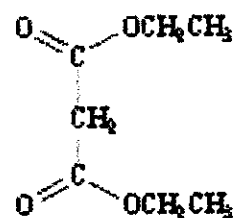
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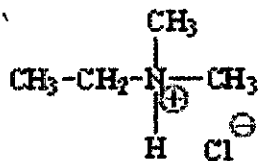
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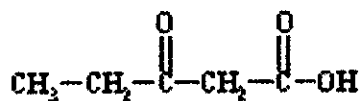
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48.



49.



50.

