

編號：E 108 系所：化學工程學系乙組

科目：有機化學

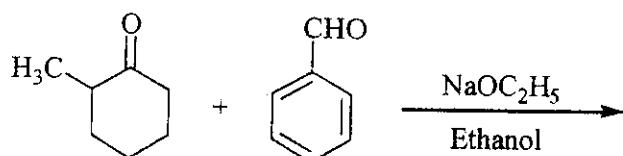
本試題是否可以使用計算機：可使用，不可使用（請命題老師勾選）

1. Explain the following terms: (20%)

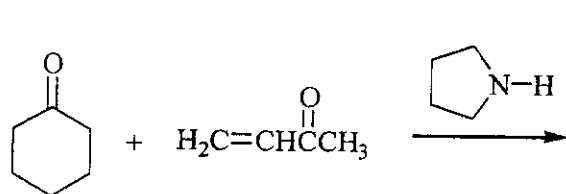
- a) HOMO and LUMO, b) Phase-transfer catalyst, c) Wittig reaction, d) Meso compound, e) Resolution of a racemic modification

2. Predict the products of the following reactions: (16%)

a)



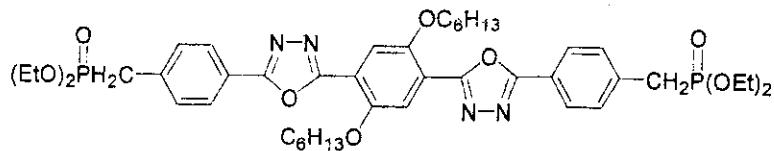
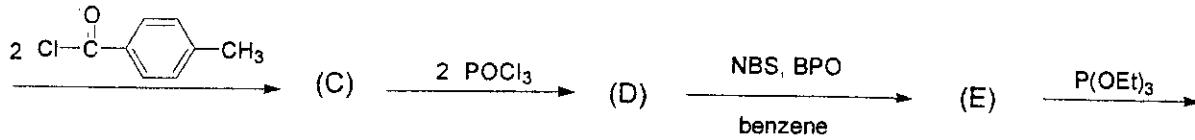
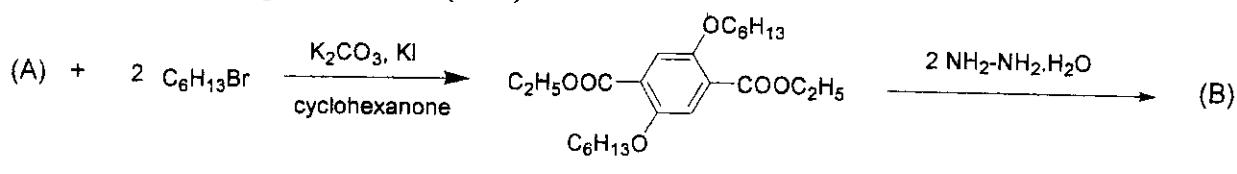
b)

c) 1,3-Butadiene + Methyl (Z)-2-butenoate  $\longrightarrow$ d) 2-Bromo-2-methylpropane + CH<sub>3</sub>CH<sub>2</sub>OH  $\xrightarrow{\Delta} \longrightarrow$ 

3. Rank the acidity order of the following compounds. (4%)

Phenol, CH<sub>3</sub>COOH, ROH, CH<sub>2</sub>ClCOOH, p-Nitrobenzoic acid, RNH<sub>2</sub>, HC≡CH

4. Finish the following reactions: (20%)



NBS: N-bromosuccinimide  
BPO: Benzoyl peroxide

(背面仍有題目, 請繼續作答)

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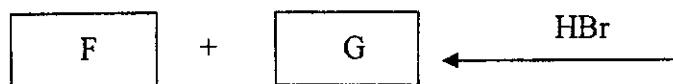
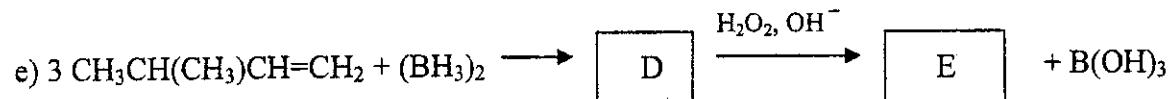
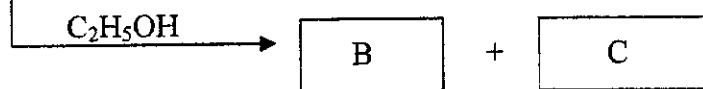
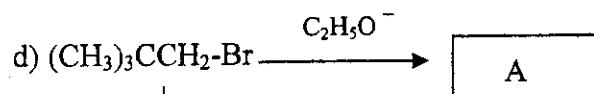
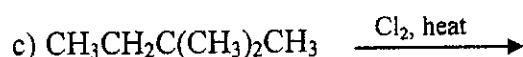
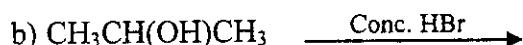
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本試題是否可以使用計算機：  可使用  不可使用 (請命題老師勾選)5. a) Describe the influences of solvent on S<sub>N</sub>2 reaction. (5%)

b) Explain the following reactivity trends: (5%)

Reactivity in gas phase: F<sup>-</sup> > Cl<sup>-</sup> > Br<sup>-</sup> > I<sup>-</sup>Reactivity in methanol solution: F<sup>-</sup> < Cl<sup>-</sup> < Br<sup>-</sup> < I<sup>-</sup>

6. Finish the following reactions and write down the chemical structure of the main products. (20%)



7. How to characterize a newly prepared organic compound (determine its chemical structure)? (10%)