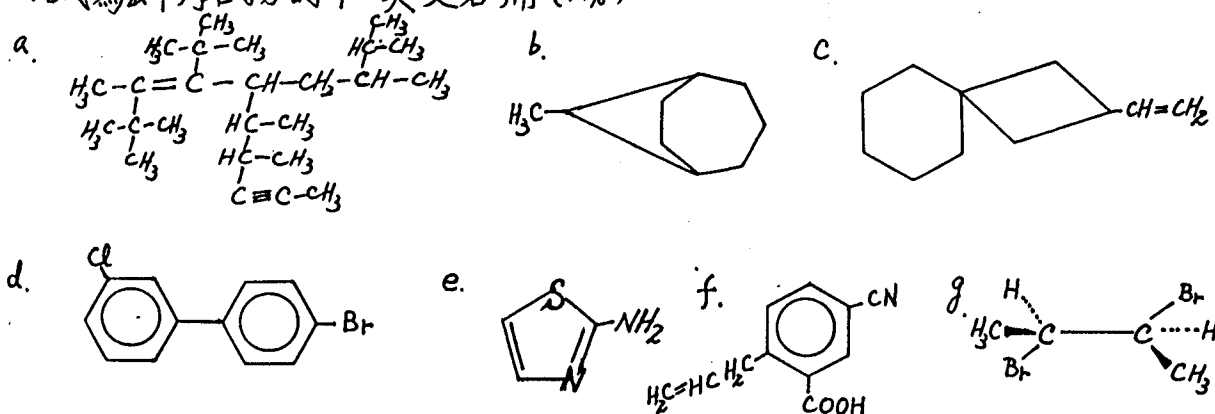


I. 1. 試寫出下列各物的中、英文名稱 (14%)

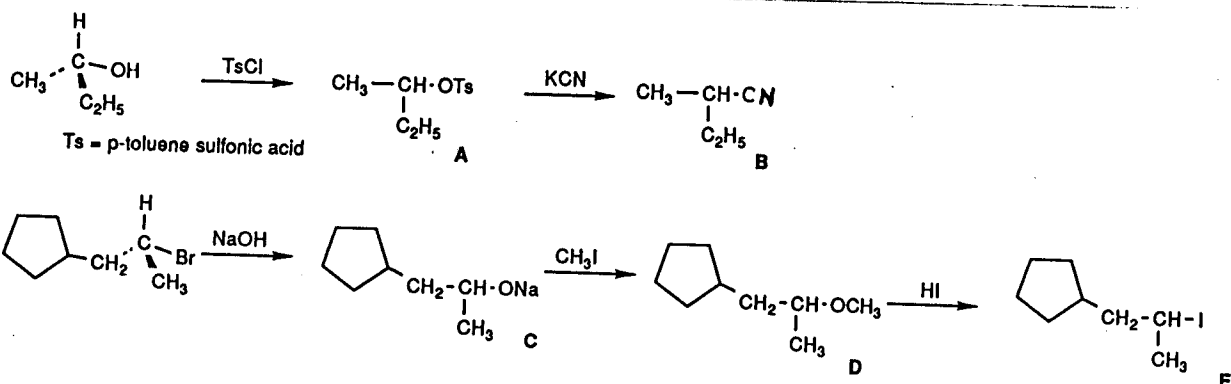


2. 試畫出下列各物的構造式 (11%)

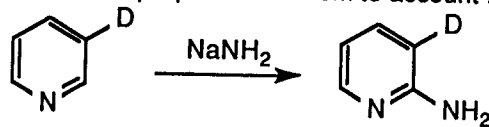
- (a) DMSO (b) Tropylium cation (c) Azulene (d) trans-1,2-dimethyloxirane
 (e) PVC (f) 3-Phenylthiopyrrole (g) Benzofurane (h) 2,4-dinitrophenylhydrazine
 (i) Cis-1,4-Dimethylcyclohexane (j) [14]-Annulene (k) Freon-11

Part II Reaction Mechanism

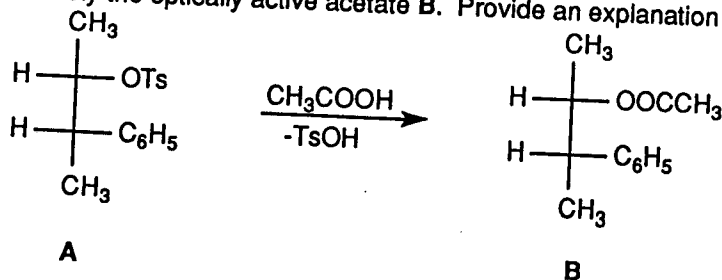
1. Each of the following reaction sequences constitutes a correct synthetic pathway from a chiral starting material. Please determine whether the product (A to E) is R or S configuration or a racemized mixture. (5%)



2. In the reaction of 3-[²H]-pyridine with sodium amide, 100% of deuterium was retained in the product, please write down the proper mechanism to account for this theme. (5%)



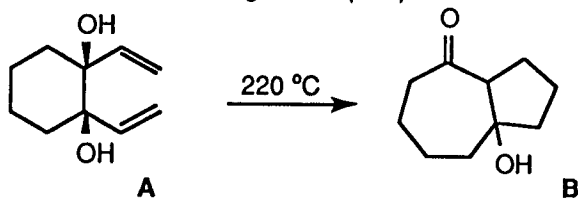
3. On the solvolysis of 1-methyl-2-methylpropyl tosylates A in acetic acid, the reaction yielded almost exclusively the optically active acetate B. Provide an explanation for this result. (5%)



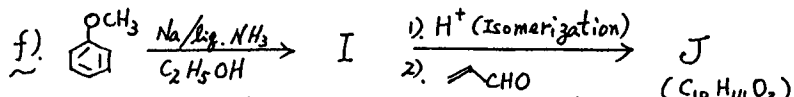
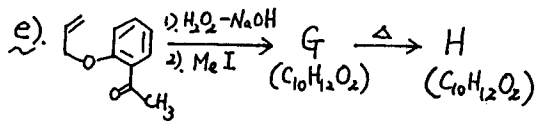
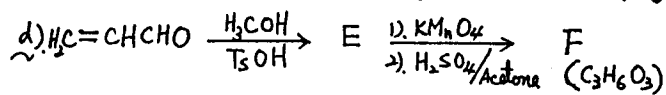
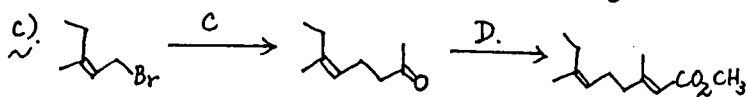
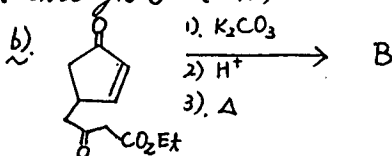
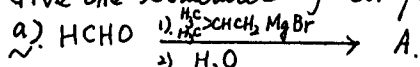
4. Please give a three-step mechanism to show the formation of an ozonide by ozonolysis of an alkene. (5%)



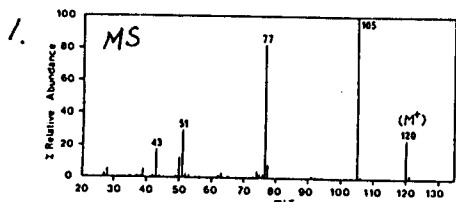
5. Compound B could be obtained by heating the compound A to 220 °C, please give the proper mechanism to account for this rearrangement. (5%)



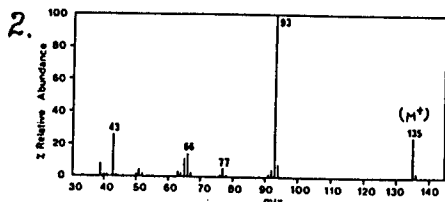
IV. Give the structures of compounds A through J (30%)



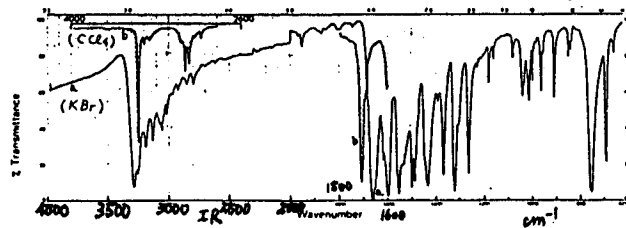
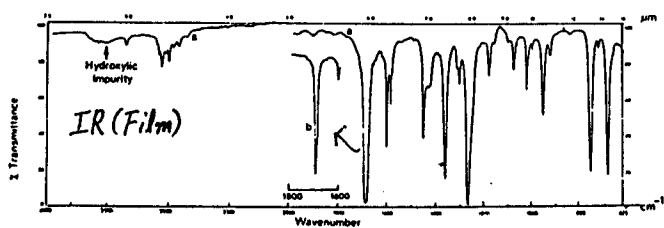
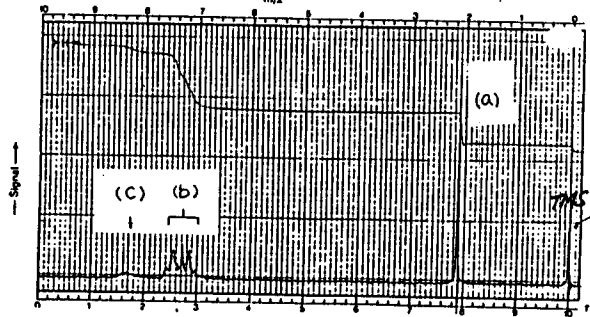
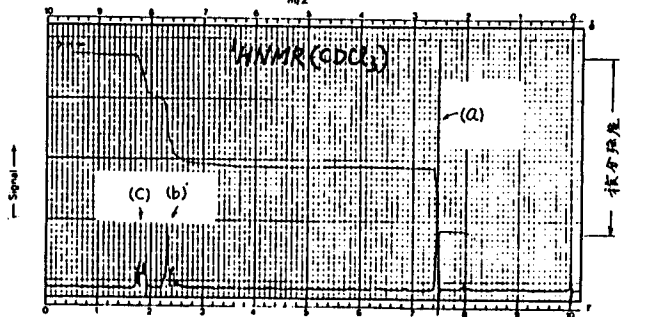
IV. 依据下列之光譜資料, 決定其化學構造式, 並說明理由。(20%)



同位素存在量:
 m/z 120(M⁺) 100%
 m/z 121(M⁺) 9.9%



同位素存在量:
 m/z 135(M⁺) 100%
 m/z 136(M⁺) 8.4%



UV λ_{max}^{MeOH} : 246 nm (ϵ 9800), 280 nm (ϵ 1100)

UV λ_{max}^{MeOH} : 239 nm