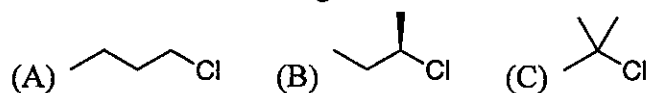
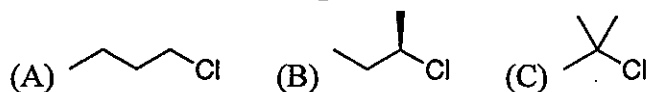


Part I. 單選題. Please select the most appropriate answer for the following questions. There is only one correct answer for each question. 請於試卷內之「選擇題作答區」依序作答。(每題 2 分, 共 12 分)

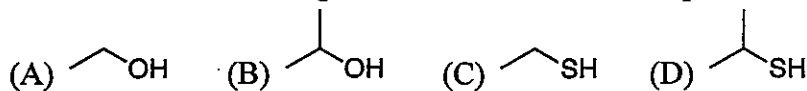
1. Which of the following is the most reactive electrophile for an  $S_N2$  reaction?



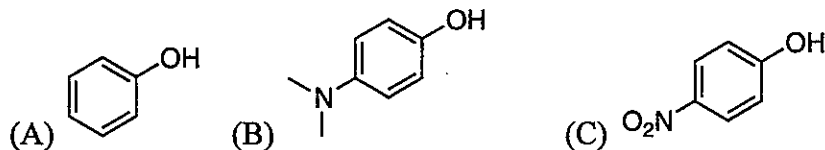
2. Which of the following is the most reactive electrophile for an  $S_N1$  reaction?



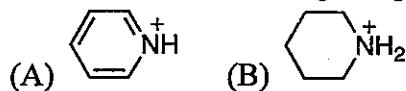
3. Which of the following is the most reactive nucleophile?



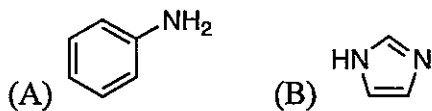
4. Which of the following compounds is the most acidic?



5. Which of the following compounds is the more acidic?



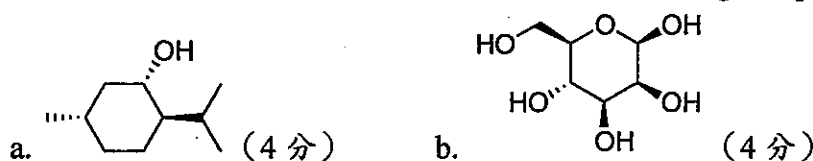
6. Which of the following compounds is the more basic?



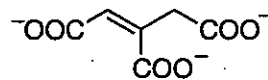
Part II. 問答題. Please provide a short answer for the following questions. 請於試卷內之「非選擇題作答區」依題號順序作答。(共 37 分)

1. Please draw the Newman projections for the most stable conformer of butane considering the rotation about the  $C_2-C_3$  bond. (4 分)

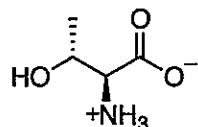
2. Please draw the most stable conformer for the following compounds. (8 分)



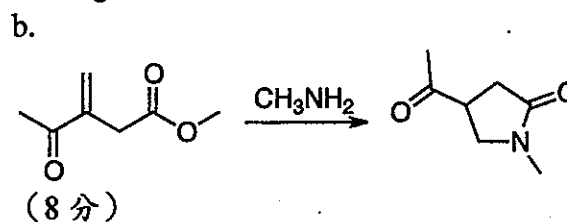
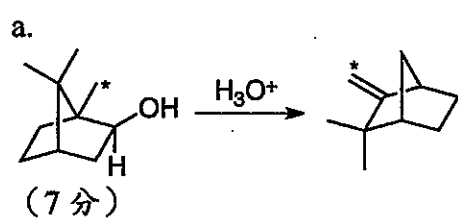
3. Water is added across the  $C=C$  double bond of the following compound in the citric acid cycle.  $H^+$  is added to the *Re* face of the  $C=C$  double bond on  $C_3$ . The addition reaction occurs with anti geometry. Please draw the chemical structure of the product in line angle structure format (also known as skeletal structures) including stereochemistry. (6 分)



4. Please assign the configuration for the chiral center(s) in the following compound. (4 分)



5. Please propose a mechanism for the following transformations. (15 分)



Part III. 簡答題. Please draw the line angle structures (also known as skeletal structures) for the major product(s) for the following reactions. If different stereoisomers are produced, please draw the different stereoisomers separately. Please include stereochemistry when necessary. 請於試卷內之「非選擇題作答區」依題號順序作答。(每題 3 分, 共 51 分)

