

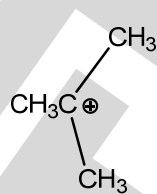
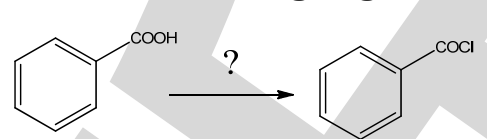
臺北醫學大學 101 學年度碩士班暨碩士在職專班招生入學考試

有機化學試題

本試題第 1 頁；共 3 頁
(如有缺頁或毀損，應立即請監試人員補發)

- 注意事項
- 一、本試題共二大題，共計 100 分。
 - 二、請將最適當的答案依題號作答於答案用卷本上。
 - 三、試題答錯者不倒扣；題次號碼錯誤或不按順序或鉛筆作答，不予計分。

一、選擇題：(75%)

- Which of the following compounds have the molecular formula $C_6H_{14}O$?
 (A) 1-hexanol (B) 2-hexanal (C) 3-methyl-2-pentene (D) cyclohexanol
- Which of the following is the most soluble in H_2O ?
 (A) $CH_3CH_2OCH_2CH_3$ (B) CH_3CH_2OH (C) $CH_3CH_2CH_2CH_3$ (D) CH_3CHO
- (-)-Mandelic acid has a specific rotation of -158° . What would be the specific rotation of a solution which contains 40% (-)-Mandelic acid and (+)-Mandelic acid?
 (A) $+95^\circ$ (B) $+63^\circ$ (C) -32° (D) $+32^\circ$
- Which of the following is a secondary alkylhalide?
 (A) CH_3Br (B) $(CH_3)_3CBr$ (C) $(CH_3)_2CHBr$ (D) $(CH_3)_2CHCH_2Br$
- Which of the following carbocations does not rearrange?
 (A) $CH_3CH_2^+$ (B) $CH_3CH^+CH_3$ (C)  (D) all the above
- Which of the following molecular changes is necessary for mass spectrometry to occur?
 (A) excitation of an electron from the ground state to higher energy state
 (B) loss of an electron
 (C) change of alignment of a proton in a magnetic field
 (D) molecular vibration
- Which of the following is the electrophile that attacks the aromatic ring during nitration?
 (A) NO_2 (B) HNO_3 (C) NO_3^- (D) NO_2^+
- Which of the following esters undergoes hydrolysis in base most easily?
 (A) $C_6H_5O_2CCH_3$ (B) p- $CH_3C_6H_4O_2CCH_3$ (C) p- $NO_2C_6H_4O_2CCH_3$ (D) $CH_3CH_2CO_2CH_3$
- Which of the following reagents is used in the following reaction?

 (A) Cl_2/P (B) Cl_2/CCl_4 (C) HCl (D) PCl_3
- Which of the following reagents can be used to reduce acetaldehyde to ethyl alcohol?
 (A) 1. $LiAlH_4$ 2. H_3O^+ (B) 1. $NaBH_4$ 2. H_3O^+ (C) H_2/Pt (D) all the above
- Which of the following compounds will give a positive iodoform test?
 (A) propanal (B) 2-pentanone (C) 3-pentanone (D) cyclohexanone
- Which of the following represents the general formula of a carbohydrate?
 (A) C_nH_{2n+2} (B) C_nH_{2n} (C) C_nH_{2n-2} (D) $C_n(H_2O)_n$
- Which of the following is the best leaving group?
 (A) F^- (B) Cl^- (C) Br^- (D) I^-
- Which of the following solvents is protic?
 (A) CH_3OH (B) CH_3OCH_3 (C) CH_3COCH_3 (D) CH_3CHO

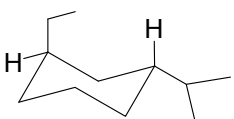
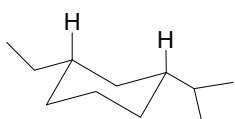
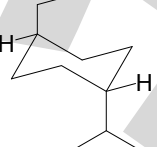
15. Arrange the following species in order of increasing basicity (weakest to strongest).

- (A) OH^- (B) Cl^- (C) H_2O (D) NH_3

16. Which of the following sets are pairs of constitutional isomers?

- (A) $\text{CH}_3\text{CH}_2\text{OCH}_3$ and $\text{CH}_3\text{CH}_2\text{CH}=\text{O}$
 (B) $\text{CH}_3\text{CH}_2\text{OCH}_3$ and $\text{CH}_3\text{C}(\text{O})\text{CH}_3$
 (C) $\text{CH}_3\text{CH}_2\text{CH}=\text{O}$ and $\text{CH}_3\text{C}(\text{O})\text{CH}_3$
 (D) $\text{CH}_3\text{CH}_2\text{OH}$ and $\text{CH}_3\text{CH}=\text{O}$

17. Which is the structure for *trans*-1-ethyl-3-isopropylcyclohexane?

- (A)  (B)  (C)  (D) 

18. Which is the IUPAC name for the following cycloalkane?

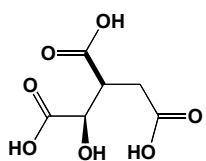


- (A) cis-1-ethyl-2-methylcyclohexane (B) trans-1-methyl-2-ethylcyclohexane
 (C) cis-1-methyl-2-ethylcyclohexane (D) trans-1-ethyl-2-methylcyclohexane

19. How many *Z*-isomers are there for an alkene with the formula $\text{C}_4\text{H}_7\text{Cl}$?

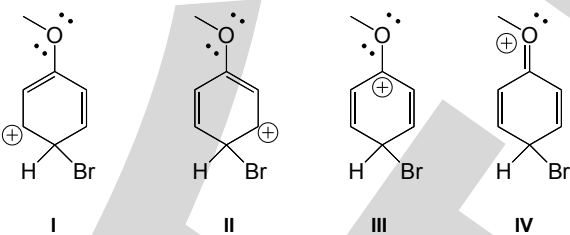
- (A) 1 (B) 2 (C) 3 (D) 4

20. What is the R, S configuration for the following structure of isocitric acid?



- (A) 2R, 3R (B) 2R, 3S (C) 2S, 3R (D) 2S, 3S

21. What is the major contributing structure to the cation intermediate of the bromination of anisole?



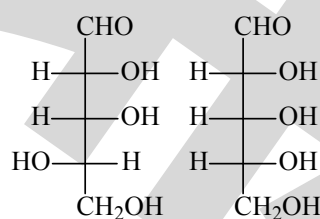
- (A) IV (B) III (C) II (D) I

22. Which sugars and classifications are correctly matched?

- I) D-Glucose and aldohexose II) D-Galactose and aldopentose
 III) D-Ribose and ketopentose IV) D-Fructose and ketohexose
 V) D-Mannose and ketohexose

- (A) I, III, V (B) I, IV (C) III, IV, V (D) II, III

23. What is the relationship between the following compounds?



- (A) enantiomers (B) anomers (C) meso compounds (D) diastereomers

