

靜宜大學 103 學年度碩士班招生考試試題

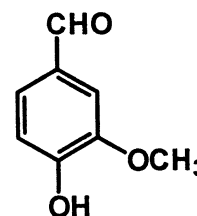
學系：化粧品科學系

科目：有機化學

Part I (50%)

一、單選題 (30 pts, 3 pts/ each)

- Which ion has the ground state electron configuration $1s^2 2s^2 2p^6$?
(A) Cl^- (B) S^{2-} (C) Li^+ (D) Mg^{2+}
- Which of the following elements has four electrons in their valance shells?
(A) Aluminum (B) Carbon (C) Oxygen (D) Fluorine
- Which compound has only covalent bonds?
(A) CH_3Cl (B) NaCl (C) NaHCO_3 (D) NH_4Cl
- Which anion is the weakest base?
(A) OH^- (B) CH_3CO_2^- (C) I^- (D) $\text{CH}_3\text{CH}_2\text{O}^-$
- Which of the following solvents is aprotic ?
(A) CH_3OH (B) CH_2Cl_2 (C) HCO_2H (D) H_2O
- Rank the following groups in order of increasing priority (least first)?
-CHO (I), -CH₃ (II), -CO₂H (III), -CH₂OH (IV)
(A) I, II, III, IV (B) II, I, III, IV (C) II, III, I, IV (D) II, IV, I, III
- Arrange the nucleophiles in order of increasing reactivity (least first)?
 Br^- (I), CH_3CO_2^- (II), CH_3OH (III), NH_3 (IV)
(A) I, II, III, IV (B) IV, II, I, III (C) III, IV, II, I (D) IV, III, II, I
- Which compound contains the stereocenter?
(A) 2-methylpentane (B) 2-bromopentane (C) 1-bromopentane (D) 3-bromopentane
- Which is the structural formula for pentanal ?
(A) $\text{CH}_3(\text{CH}_2)_3\text{CHO}$ (B) $\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{OH}$ (C) $\text{CH}_3(\text{CH}_2)_3\text{CO}_2\text{H}$ (D) $\text{CH}_3\text{CH}_2\text{CHO}$
- Which is the correct IUPAC name for the following compound?
(A) 1-hydroxy-2-methoxybenzaldehyde (B) 2-methoxy-4-oxophenol
(C) 4-hydroxy-3-methoxybenzaldehyde (D) 2-hydroxy-5-oxoanisole



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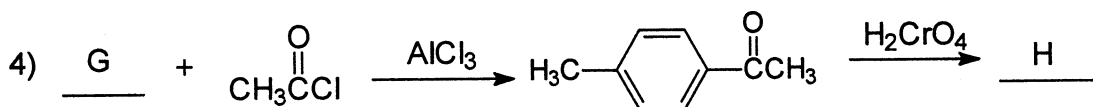
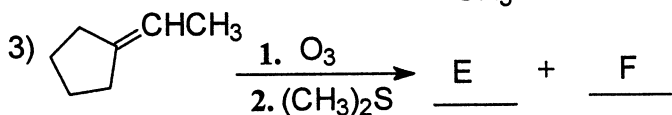
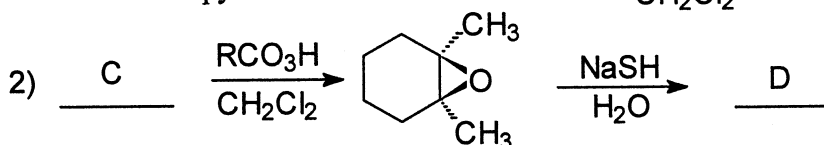
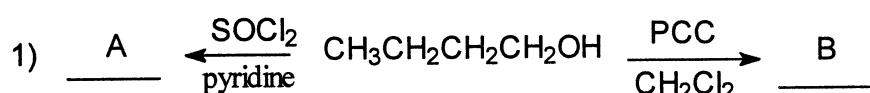
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Part I

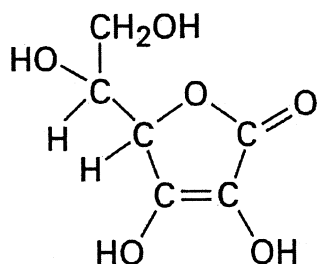
二、非選擇題

1. Please write the structural formula for the **major product** in each of the following reactions.
(Note: Please give the correct stereochemistry, if necessary.) (20 pts, 5pts/each)

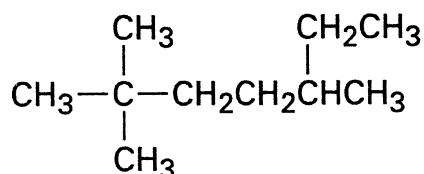


Part II (50%)

1. Calculate the number of sigma (σ) and pi (π) of the following compounds?
(8%)



2. Calculate the number of primary carbon, secondary carbon, tertiary carbon and quaternary carbon of the following compound? (12%)



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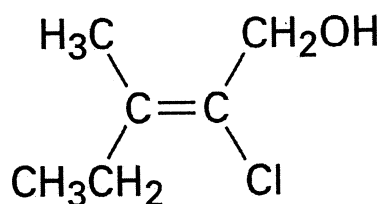
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3. Draw the structures corresponding to the following compound? (16%)

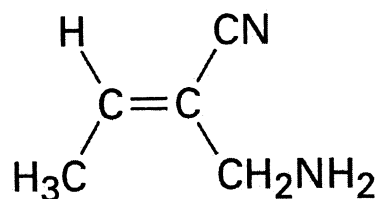
- (i) line-bond structure of HNO_3 (ii) 3-ethyl-2-methylhexane
(iii) 1,5-dimethylcyclopentene (iv) 6-methyl-3-octyne

4. Determine Z or E for the following compounds? (8%)

(i)



(ii)



5. Synthesis of *m*-bromobenzoic acid from benzene? (6%)

