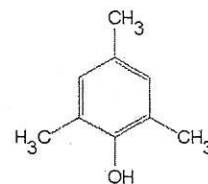
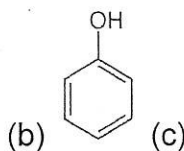
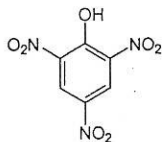


招生學年度	104	招生類別	碩士班	5
系所班別	化學系碩士班、材料科學與工程學系碩士班			
科目名稱	普通化學			
注意事項	本考科可使用掌上型計算機			

一. 選擇題 (單選題每題 2 分) -18

- Which one has the lowest specific heat capacity? (a) ice, (b) water, (c) iron.
- Which one has the lowest electron affinity? (a) F, (b) Cl, (c) Br, (d) I.
- Which one has the smallest ionization energy? (a) Li, (b) Na, (c) Rb, (d) Cs, (e) K.
- Which one has the highest lattice energy? (a) NaF, (b) KF, (c) MgO, (d) CaO.
- Is the sum of first and second electron affinities of oxygen atom? (a) Endothermic, (b) Exothermic.
- $C=C$ is 614 kJ/mol, what is possible bond energy of $C-C$? (a) 300, (b) 347, (c) 307 kJ/mol.
- The probability of finding e^- : (a) Ψ^{-1} , (b) Ψ , (c) Ψ^2 , (d) Ψ^3 , (e) Ψ^4 .
- Which one is most reactive? (a) Xe, (b) Fe, (c) Au, (d) K, (e) diamond.

9. 以下哪個的酸性最強? (a)



二. 填充題 (每題 3 分) - 6

1. 毒澱粉是利用澱粉的_____官能基與_____進行_____反應。

三. 畫圖題 (每題 4 分) -20

1. toluene 2. para-xylene 3.
- P_4
4. Na [
- e^-
- configuration] 5. 3s, 3p, 3d 軌域的 radial 電子機率分佈

四. 命名題 [請寫出英文全名 每題 2 分]-8

- 1.
- H_2SO_4
- 2.
- CH_3COOH
- 3.
- C_3H_8
- 4.
- HgO

五. 解釋名詞 (每題 4 分) - 16

1. Halogens 2. Electronegativity 3. Like-dissolve-like 4. 2e-3c Bond

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六. 問答題 (每題 8 分) -32

- Citric acid, which can be obtained from lemon juice, has the molecular formula $C_6H_8O_7$. A 0.250-g sample of citric acid dissolved in 25.0 mL of water requires 37.2 mL of 0.105 M NaOH for complete neutralization. What number of acidic hydrogens per molecule does citric acid have?
- 請劃出 N_2 分子的 molecular orbital energy level diagram. 請標示清楚(比如 σ_{2p}^*). 並請計算其 bond order. 也請寫出其磁性.
- (a) Draw the Lewis structure and use VSEPR to determine geometry (3-D shapes) with approximate bond angles of the following molecules. (b) Are they polar/nonpolar molecules? (c) Indicate formal charges on each atoms.
 (1) O_3 (2) SF_4
- When propane is reacted with Br_2 ($h\nu$, $125^\circ C$), what are produced besides HBr. Explain the ratio of products.