銘傳大學 95 學年度轉學生招生考試

生物科技學系

7 月 26 日第四節　　（第 1 頁共 1 頁）

普通化學試題　　（限用答案本作答）

Allow to use calculator if necessary (可以使用計算機)

1. Write each answer with a reasonable number of significant figures: (10 pts)
   (a) 3.021 + 8.99 =　　(b) 6.345 × 2.6 =
2. The pressure on 474 mL of a gas is changed from 726 mm-Hg to 622 mm-Hg. What is the volume at the new pressure? (8 pts)
3. Write the formulas of the magnesium sulfate, sodium chloride and lithium bromite? (9 pts)
4. A compound is analyzed and found to contain 0.279g C, 0.0469g H, and 0.124g O. Its molecular mass 116g/mole. What is its molecular formula? (10 pts)
5. ΔH= +572 kJ for decomposition of water by the reaction, $2\ H_2O(l) \rightarrow 2\ H_2(g) + O_2(g)$. How many grams of water can be decomposed by 5000 kJ of energy? (8 pts)
6. What is the electron pair geometry surrounding the boron atom in BH_3? (5 pts)
   (A) Trigonal planar (B) Linear (C) Angular bent (D) Tetrahedral (E) Trigonal pyramid
7. Which of the following molecules is/are nonpolar? (5 pts)
   (A) NH_3 (B)H_2O (C) HCl (D)CH_4 (E) CH_2Cl_2
8. Which of the following compounds is ether? (5 pts)
   (A) C_6H_{12} (B) CH_3OH (C) CH_3CH_2COOH (D) $CH_3CH_2CH_3$ (E) None is an ether
9. Which of the following solutions is most acidic? (5 pts)
   (A) $[H^+] = 1 \times 10^{-4}$ (B) pH = 10 (C) pOH = 12 (D) $[H^+] = 1 \times 10^{-10}$ (E) $[OH^-] = 1 \times 10^{-8}$.
10. In predicting the effect of a disturbance on a system at equilibrium, which of the following is considered? (5 pts)
    (A) Le Chatelier's Principle (B) The Law of Conservation of Mass (C) The Pauli Exclusion Principle (D) The Law of Conservation of Energy (E) The Law of Multiple Proportions
11. $K_a = 1.8 \times 10^{-5}$ for the ionization of HA(aq). Determine the $[HA]/[A^-]$ ratio that will produce a buffer at pH= 5.00. (15 pts)
12. Vitamin C was measured by an electrochemical method in a 50.0 mL sample of lemon juice. A detector signal of 2.02 nA was observed. A standard addition of 1.00 mL of 29.4 mM vitamin C increased the signal to 3.79 nA. Find the concentration of vitamin C in the juice. (15 pts)

試題完