

國立屏東教育大學 99 學年度學士班轉學考試

普通化學 試題

(化學生物系)

*注意事項：

- (1) 本試題共 4 頁，答案請「橫式」書寫，並依規定上下翻頁，否則不予計分。
(2) 不必抄題，但請依序將題號標出，並寫在答案紙上。

選擇題 (每題 4 分，共 100 分)

1. A separation process that depends on differing abilities of substances to form gases is called _____.

- (A) filtration (B) solvation (C) distillation (D) chromatography
(E) All of the above are correct.

2. Aluminum reacts with a certain nonmetallic element to form a compound with the general formula AlX . Element X is a diatomic gas at room temperature. Element X must be _____.

- (A) oxygen (B) fluorine (C) chlorine (D) nitrogen (E) sulfur

3. A compound that is composed of carbon, hydrogen, and oxygen contains 70.6% C, 5.9% H, and 23.5% O by mass. The molecular weight of the compound is 136 amu. What is the molecular formula?

- (A) $C_8H_8O_2$ (B) C_8H_4O (C) C_4H_4O (D) $C_9H_{12}O$ (E) $C_5H_6O_2$

4. The concentration of species in 500 mL of a 2.104 M solution of sodium sulfate is _____ M sodium ion and _____ M sulfate ion.

- (A) 2.104, 1.052 (B) 2.104, 2.104 (C) 2.104, 4.208 (D) 1.052, 1.052
(E) 4.208, 2.104

5. The 4d subshell in the ground state of atomic xenon contains _____ electrons.

- (A) 2 (B) 6 (C) 8 (D) 10 (E) 36

6. Of the following elements, _____ has the most negative electron affinity.

- (A) S (B) Cl (C) Se (D) Br (E) I

7. "Isothermal" means _____.

- (A) at constant pressure
(B) at constant temperature
(C) at variable temperature and pressure conditions
(D) at ideal temperature and pressure conditions
(E) that $\Delta H_{\text{rxn}} = 0$

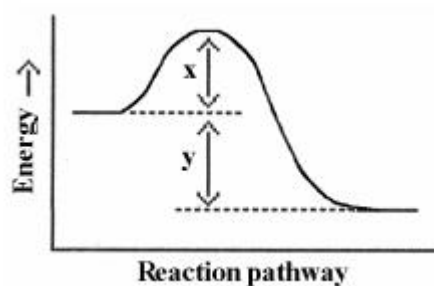
8. Which one of the following exhibits dipole-dipole attraction between molecules?

- (A) XeF_4 (B) AsH_3 (C) CO_2 (D) BCl_3 (E) Cl_2

9. Of the following, a 0.2 M aqueous solution of _____ will have the highest freezing point.

- (A) $(\text{NH}_4)_3\text{PO}_4$ (B) $\text{Pb}(\text{NO}_3)_2$ (C) Na_3PO_4 (D) $\text{Mg}(\text{NO}_3)_2$ (E) NaCl

10. Which energy difference in the energy profile below corresponds to the activation energy for the forward reaction?



- (A) x (B) y (C) $x + y$ (D) $x - y$ (E) $y - x$

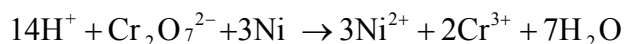
11. How is the reaction quotient used to determine whether a system is at equilibrium?

- (A) The reaction quotient must be satisfied for equilibrium to be achieved.
(B) At equilibrium, the reaction quotient is undefined.
(C) The reaction is at equilibrium when $Q < K_{\text{eq}}$.
(D) The reaction is at equilibrium when $Q > K_{\text{eq}}$.
(E) The reaction is at equilibrium when $Q = K_{\text{eq}}$.

12. CFC stands for _____.

- (A) chlorinated freon compound
- (B) chlorofluorocarbon
- (C) carbonated fluorine compound
- (D) caustic fluorine carbohydrate
- (E) carbofluoro compound

13. Which substance is serving as the reducing agent in the following reaction?



- (A) Ni (B) H^+ (C) $\text{Cr}_2\text{O}_7^{2-}$ (D) H_2O (E) Ni^{2+}

14. Which one of the following is a correct representation of a beta particle?

- (A) ${}^4_2\text{e}$ (B) ${}^1_0\beta$ (C) ${}^0_1\text{e}$ (D) ${}^0_{-1}\text{e}$ (E) ${}^2_4\beta$

15. The correct name of H_2CO_3 is _____.

- (A) hydrogen carbide
- (B) hydrogen carbonate ion
- (C) carbonate ion
- (D) carbonic acid
- (E) carboxylic acid

16. How many protons, neutrons, and electrons does the atom ${}^{208}\text{Pb}$ have?

- (A) 82 protons, 82 neutrons, 82 electrons.
- (B) 82 protons, 82 neutrons, 126 electrons.
- (C) 82 protons, 82 neutrons, 208 electrons.
- (D) 82 protons, 126 neutrons, 126 electrons.
- (E) 82 protons, 126 neutrons, 82 electrons

17. A sample of carbon weighing 4.804 g contains how many moles of iron atoms?

- (A) 0.400 moles. (B) 0.500 moles. (C) 0.800 moles. (D) 1.000 moles. (E) 1.200 moles

18. What is the molar mass of ethanol ($\text{C}_3\text{H}_7\text{OH}$)?

- (A) 45.07. (B) 38.90. (C) 46.07. (D) 60.09. (E) 74.12.

19. A 18.23 g sample of HCl is dissolved in water to give 2.0×10^3 mL of solution. The concentration of the solution is

