國立高雄師範大學 107 學年度學士班轉學生招生考試試題

系所別：化學系二年級

科　目：普通化學

※注意：1.不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上，於本試題上作答者，不予計分。

2.限用藍色或黑色之鋼筆、原子筆作答，以鉛筆或其他顏色作答者不予計分。

一、選擇題：(每題 5%，共 70%)

1. The first law of thermodynamics provides us with

（A）concept of entropy　（B）sum of direction of forces of heat

（C）measure of temperature　（D）inter–convertibility of work and energy

2. A system with greater energy has

（A）lower enthalpy （B）lower stability （C）higher stability （D）lower temperature

3. For a spontaneous process at constant temperature and pressure which of the following is true

（A）$\Delta G > 0$　（B）$\Delta H = 0$　（C）$\Delta S > 0$　（D）$\Delta G = 0$

4. All natural process are

（A）spontaneous　（B）induced　（C）catalyzed　（D）forced

5. In the following reaction, the entropy _____

$2\,O_3 \longrightarrow 3\,O_2$

（A）increases　（B）decreases　（C）neither increase nor decrease　（D）uncertain

6. Isochoric process means

（A）constant entropy　（B）constant temperature

（C）constant volume　（D）constant enthalpy

7. Missing Cl^- ion in NaCl crystal is

（A）metal excess defect　（B）metal deficiency defect

（C）Frenkel defects　（D）schottky defects

8. Frenkel defect occurs in ionic crystal if the size of ions is

（A）identical　（B）one is larger than other

（C）AB type crystal with identical atoms　（D）A & B

（背面有題　續翻背面）

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9. What is the heat of fusion of ice cream if 10 moles of ice cream take 4987J to melt to liquid at 0’C?
（A）498.7 J/mole （B）166.8 J/mole （C）4.987 J/mole （D）1.688 J/mole

10. Entropy of perfect crystal at -273.15’C is
（A）negative （B）greater than zero （C）0 （D）uncertain

11. Which of the following shows these molecules in order from most polar to least polar?
（A）$CH_4 > CF_2Cl_2 > CF_2H_2 > CCl_4 > CCl_2H_2$
（B）$CH_4 > CF_2H_2 > CF_2Cl_2 > CCl_4 > CCl_2H_2$
（C）$CF_2Cl_2 > CF_2H_2 > CCl_2H_2 > CH_4 = CCl_4$
（D）$CF_2H_2 > CCl_2H_2 > CF_2Cl_2 > CH_4 = CCl_4$

12. A balloon contains 10.0 g of neon gas. With the temperature kept constant, 10.0 g of argon gas is added. What happens?
（A）The balloon doubles in volume.
（B）The volume of the balloon expands by more than 2 times.
（C）The volume of the balloon expands by less than 2 times.
（D）The balloon stays the same size, but the pressure increases.

13. Choose the metal with the smallest radius.
（A）Ca
（B）Na
（C）K
（D）Al

14. For which of the following transitions does the light emitted have the longest wavelength?
（A）$n = 4$ to $n = 3$
（B）$n = 4$ to $n = 2$
（C）$n = 4$ to $n = 1$
（D）$n = 3$ to $n = 2$

二、簡答題：（30％）

1. What is the difference between ΔH and ΔE at constant pressure?（10％）

2. Draw a Lewis structure that obeys the octet rule for each of the following molecules and ions. In each case the first atom listed is the central atom. （20％）
（a） $POCl_3$, SO_4^{2-}, XeO_4, PO_4^{3-}, ClO_4^-
（b）NF_3, SO_3^{2-}, PO_3^{3-}, ClO_3^-, ClO_2^-.