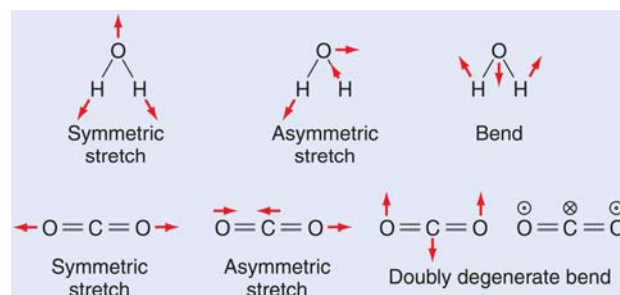


*可使用電子計算機

問答題：

- (1) 何謂蛋白質 Primary 與 Secondary structure? 如何測定? (5%)
(2) 何謂 Reversible enzyme inhibition? 如何測定? (5%)
- Glycolysis 與 TCA cycle (5%)
- Sphingolipids 與 Lipoproteins (5%)
- mRNA synthesis 與 Processing (5%)
- Western 與 Southern blot analysis (5%)
- Is the function $\sqrt{x^2 + y^2}$ an eigenfunction of the operator $\frac{1}{x}(x^2 + y^2)\frac{\partial}{\partial x}$? If so, what is the eigenvalue? (5%)
- Which of the following vibrational modes are IR active? (5%)



- Write the Slater determinant for the ground-state configuration of Li. (5%)
- How many types of energy level are there for polyatomic molecules? Arrange them in order of increasing energy-level spacing. (5%)
- Consider the reaction $A \xrightarrow{k_A} I_1 \xrightarrow{k_1} I_2 \xrightarrow{k_2} P$. Assuming that only reactant A is present at $t = 0$, what is the expected time dependence of [P] using the steady-state approximation? (5%)
- Describe why the number of valence electron (NVE) is often equal to 18 for transition-metal organometallics and for many inorganic complexes. (10%)
- Describe the reasons respectively why the $\nu(\text{CO})$ frequency increases and decreases in carbonyl complexes. (10%)
- Describe the phenomenon of s-p mixing in N_2 molecule. (5%)
- Please indicate the possible sources of (a.) random error and (b.) systematic error in chemical analyses. (5% each)
- Assuming a aqueous solution that is 0.200 M in NH_3 and 0.300 M in NH_4Cl : (5% each)
 - Calculate the pH of this aqueous solution.
 - Calculate the pH change that takes place when a 100-mL portion of 0.0500 M $\text{NaOH}_{(\text{aq})}$ is added to 400 mL of this solution
- Please plot the instrument component configuration of an absorption (ex: UV/Vis) spectrometer. (5%)

命題教師簽章：_____

(簽章請勿超過虛線)

高雄醫學大學 101 學年度 研究所 招生考試

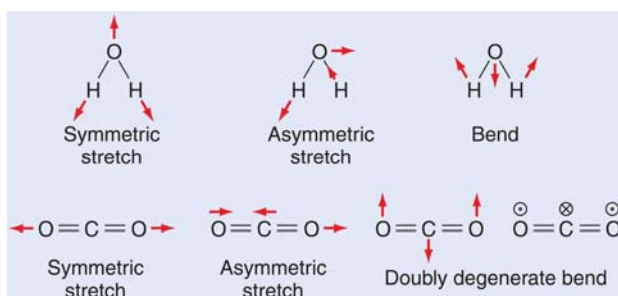
考試科目：醫藥暨應用化學系碩
士班-「綜合化學-生物化學」

試題 第 頁

問答題：

- I. (1) 何謂蛋白質 Primary 與 Secondary structure? 如何測定?
(2) 何謂 Reversible enzyme inhibition? 如何測定?
- II. Glycolysis 與 TCA cycle
- III. Sphingolipids 與 Lipoproteins
- IV. mRNA synthesis 與 Processing
- V. Western 與 Southern blot analysis

1. Is the function $\sqrt{x^2 + y^2}$ an eigenfunction of the operator $\frac{1}{x}(x^2 + y^2)\frac{\partial}{\partial x}$? If so, what is the eigenvalue? (5%)
2. Which of the following vibrational modes are IR active? (5%)



3. Write the Slater determinant for the ground-state configuration of Li. (5%)
4. How many types of energy level are there for polyatomic molecules? Arrange them in order of increasing energy-level spacing. (5%)
5. Consider the reaction $A \xrightarrow{k_A} I_1 \xrightarrow{k_1} I_2 \xrightarrow{k_2} P$. Assuming that only reactant A is present at $t = 0$, what is the expected time dependence of [P] using the steady-state approximation? (5%)

命題教師簽章：

_____ (簽章請勿超過虛線)

高雄醫學大學 101 學年度 研究所 招生考試 考試科目：無機化學

試題 第 1 頁

1. Describe why the number of valence electron (NVE) is often equal to 18 for transition-metal organometallics and for many inorganic complexes. (10)
2. Describe the reasons respectively why the $\nu(\text{CO})$ frequency increases and decreases in carbonyl complexes.(10)
3. Describe the phenomenon of s-p mixing in N_2 molecule.(5)

命題教師簽章： _____
(簽章請勿超過虛線)

高雄醫學大學 101 學年度 研究所 招生考試 考試科目：綜合化學-分析化學 試題 第 1 頁

*可使用電子計算機

1. Please indicate the possible sources of (a.) random error and (b.) systematic error in chemical analyses. (5pts each)
2. Assuming a aqueous solution that is 0.200 M in NH_3 and 0.300 M in NH_4Cl : (5pts each)
 - (a.) Calculate the pH of this aqueous solution.
 - (b.) Calculate the pH change that takes place when a 100-mL portion of 0.0500 M $\text{NaOH}_{(\text{aq})}$ is added to 400 mL of this solution
3. Please plot the instrument component configuration of an absorption (ex: UV/Vis) spectrometer. (5pts)