

靜宜大學 101 學年度碩士班暨碩士在職專班招生考試試題

學系： 應用化學系

科目： 分析化學

**分析化學-I (50%)**

1. (10%) Why phosphoric acid ( $\text{H}_3\text{PO}_4$ ) (pKa1=2.12, pKa2=7.21, and pKa3=12.67 values at 25 °C) is often used for the preparation of pH 9.0 buffer than acetic acid (a pKa value of 4.75) ?
2. (10%) Name two instruments that are often used for (a) metal analysis (b) structure determination.
3. (10%) Give the reasons in detailed why magnetic field is often required for (a) MS and (b) NMR.
4. (10%) Give the theory and the instrument that involved in (a) UV and (b) Raman Spectroscopy.
5. (10%) Compare AAS to AES in the respect of theory and instrument.

**分析化學-II (50%)**

1. Some factors listed in the following that were chosen for the separation and quantitation in chromatography. The factors were including (i) material composition of stationary, (ii) length of column and (iii) composition of mobile phase, respectively. Describe the reasons. (18%)
2. Describe the advantages among GC (gas chromatography), HPLC (high performance liquid chromatography) and CZE (capillary zone electrophoresis), respectively? (18%)
3. The temperature (T) could be a variable in gas chromatography (GC) and be also in supercritical-fluid chromatography (SFC). Describe the reasons. (14%)