

國立臺灣科技大學

九十四學年度博士在職專班招生考試試題

系所組別：工程技術研究所博士在職專班甲組

科目：科技實務

總分100分**1. Please explain the following: (40%)**

- | | |
|-----------|-------------------|
| (1) CIM | (2) AGV |
| (3) AS/RS | (4) SCADA |
| (5) DSP | (6) Servo Control |
| (7) FPD | (8) SoC |

2. A position control with LVDT is requested for the position accuracy of 0.01 mm. The overall displacement is 10cm and the input signal range of ADC (Analogue Digital Converter) is 0~10 volt. Please decide the suitable bit number of ADC for this application. (20%)

3. Please translate the following text into Chinese: (20%)

Development in the field of pneumatic valves is driven by the requirements of automation technology. Pneumatics has proven itself as an engine of innovation in fluid power. Trends for miniaturization, improved dynamics, use of piezoelectric technology and the application of field bus technology were seen much earlier in pneumatics compared to hydraulics. A recent trend in valve development is focused on low power and small size micro valves incorporating silicon etching technology. Based on the ability of using pulse width modulated controls achieving a quasi analog performance in pneumatics on/off type valves will also be considered.

4. Please translate the following text into English: (20%)

本文以 PC-based 控制器發展「氣壓—壓電混合定位系統」(pneumatic-piezoelectric hybrid positioning system)，由於壓電致動器(piezoelectric actuator)具有質輕、體積小、響應快及高解析度等優點，故以氣壓缸(pneumatic cylinder)進行大衝程之粗定位，且同時以壓電致動器進行小衝程之精密定位，形成二輸入單輸出(dual-input single-output, DISO)之控制系統，以壓電致動器補償傳統氣壓伺服定位系統控制精度不足之缺點。