

# 國立臺北科技大學 102 學年度碩士班招生考試

系所組別：1420 能源與冷凍空調工程系碩士班乙組

## 第二節 自動控制 試題

第一頁 共一頁

### 注意事項：

1. 本試題共 5 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. Write down the definition of Laplace Transform with s parameter in real and imaginary parts. (10 pts) Explain how s parameter can be used to identify the stability of a control system. (10 pts)
2. Calculate steady state error of the following system with unity step function input and if  $N = 0$ .  
$$G(s) = \frac{K \prod_{i=1}^M (s + z_i)}{s^N \prod_{k=1}^Q (s + p_k)}$$
  
(20 pts)
3. Describe the working principals of PID controller. (10 pts) Explain how we can adjust PID controller to achieve energy saving goals for an air conditioning system. (10 pts)
4. Describe the working principals of inverter control. (10 pts) Give two examples about energy saving control of air-conditioning and refrigerating system using inverter control. (Above each 5 pts, total 10 pts)
5. Explain the following glossary (Each 5 pts, total 20 pts):
  - (a). ON-Off control
  - (b). Fuzzy control
  - (c). Adaptive control
  - (d). Control in frequency domain