

# 國立彰化師範大學107學年度碩士班招生考試試題

系所：車輛科技研究所

選考丙

科目：自動控制

☆☆請在答案紙上作答☆☆

共1頁，第1頁

1. 敘述自動控制與車輛科技研究的相關性及其重要性。(70%)

2. 解釋下列名詞。(10%)

- (1) Bounded Input Bounded Output Stability.
- (2) Linear Time Invariant System.
- (3) Gain and Phase Margins.
- (4) Dynamic Feedback.
- (5) Lead and Lag Compensations.

3. 如下之系統動態方程式：(10%)

$$\ddot{y} + 5\dot{y} + 9y = 9u$$

求解(1) Undamped natural frequency  $\omega_n$  ?

(2) Damping ratio  $\zeta$  ?

(3) Time constant  $\tau$  ?

(4) Damped natural frequency  $\omega_d$  ?

(5) Characteristic equation of the above system ?

4. 一系統之特徵方程式(Characteristic Equation)為  $s^4 + 6s^3 + 11s^2 + 6s + K = 0$ ，若系統為穩定，則  $K$  之範圍為何？(10%)