

國立彰化師範大學 102 學年度碩士班招生考試試題

系所：工業教育與技術學系

組別：乙組(選考甲)

科目：自動控制

☆☆請在答案紙上作答☆☆

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3. A system is described by

$$\dot{x}(t) = \begin{bmatrix} -2 & 1 \\ 1 & -2 \end{bmatrix} x(t) + \begin{bmatrix} 1 \\ 2 \end{bmatrix} u(t)$$

$$y(t) = [1 \quad 1]x(t)$$

- (1) Is this system stable? (10%)
 - (2) Is this system controllable? (5%)
 - (3) Is this system observable? (5%)
- (Please show your calculation process in details)

4. Please sketch the Bode plot (frequency responses) for the following systems.

(1) $G(s) = \frac{s}{s+100}$ (5%)

(2) $G(s) = \frac{100}{s+100}$ (5%)

(3) $G(s) = 0.01s + 1$ (5%)

(4) $G(s) = \frac{10000}{s^2 + 200s + 10000}$ (5%)

(5) $G(s) = \frac{s}{s^2 + 200s + 10000}$ (5%)

(6) $G(s) = \frac{s^2}{s^2 + 200s + 10000}$ (5%)