

國立彰化師範大學105學年度碩士班招生考試試題

系所： 車輛科技研究所(選考丙)、
機電工程學系(選考丙)

科目： 自動控制

☆☆請在答案紙上作答☆☆

共 1 頁，第 1 頁

1. Find the functions of time t according to the following Laplace transform with zero initial conditions.

(1) $\frac{s}{(s+4)(s+5)}$ (10%)

(2) $\frac{1}{s^2(s+3)}$ (10%)

2. Sketch the Bode plot of the transfer function $\frac{100}{s(s+10)}$. (15%, Gain:10%, Phase:5%)

3. The closed-loop transfer function is $\frac{K}{s(s+1)(s^2+s+1)+K}$. Find the range of K if the closed-loop transfer function, $\frac{K}{s(s+1)(s^2+s+1)+K}$, is BIBO stable. (15%)

4. Find the eigenvalues of the matrix $\begin{bmatrix} 0 & 0 & -2 \\ 0 & 1 & 0 \\ 1 & 0 & 3 \end{bmatrix}$. (15%)

5. State the following terminologies.

- (1) Damping ratio of second order system. (5%)
- (2) System type (e.g., type 0, type 1, type 2,etc.). (5%)
- (3) State equation. (5%)
- (4) Step response. (5%)
- (5) Frequency response. (5%)
- (6) Output equation. (5%)
- (7) Transfer function. (5%)