

自动化所之组 - 自动控制 - 4月22日第3节 - 考试科目 - 自动控制 - 试卷日期 - 4月22日第3节 - 备讨 - P2-1, p2-2 计算机

系所組別	考試科目 (或代名稱)	考試日期	備討
自动化所之組	自动控制	4月22日第3节	P2-1, p2-2 计算机

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

1.(10%)A system is described by the following differential equation:

$$\frac{d^3 y}{dt^3} + 3 \frac{d^2 y}{dt^2} + 2 \frac{dy}{dt} + 6y = \frac{d^3 x}{dt^3} + 2 \frac{d^2 x}{dt^2} - 5 \frac{dx}{dt} - 6x$$

Find (1)the expression for the transfer function of the system, $Y(s)/X(s)$.

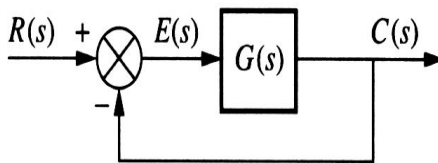
(2)zeros and poles.

2.(15%)The closed-loop transfer function of a system is

$$T(s) = \frac{s+5}{s^5 - s^4 + 3s^3 - 3s^2 + 2s - 1}$$

Determine how many closed-loop poles lie in the right half-plane, the left half-plane, and on the $j\omega$ -axis.

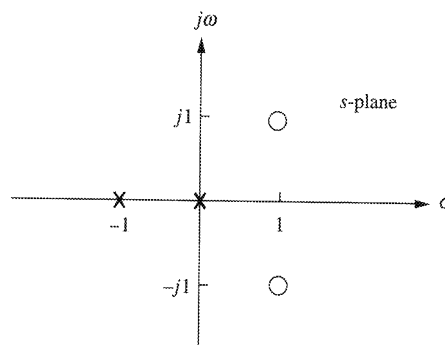
3.(20%) Given the unity feedback system with $G(s) = \frac{K(s-1)(s-2)}{(s+1)(s+2)}$



Find (1) the range of K that keeps the system stable

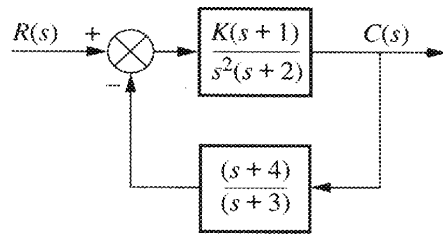
(2) the value of K that makes the system oscillate

4.(15%)For the open-loop pole-zero plot shown in Fig., sketch the root locus and find the breakaway point.



5.(20%)

- (1) Please find the closed-loop transfer function. (6%)
- (2) What is the system type? (7%)
- (3) If the system is stable, find $K=?$ (7%)



6.(20%) Sketch the Bode plot for $G(s) = \frac{s(s+3)}{(s+1)}$

本文件僅供參考