國立臺北科技大學 108 學年度碩士班招生考試

系所組別：2132 電機工程系碩士班丙組
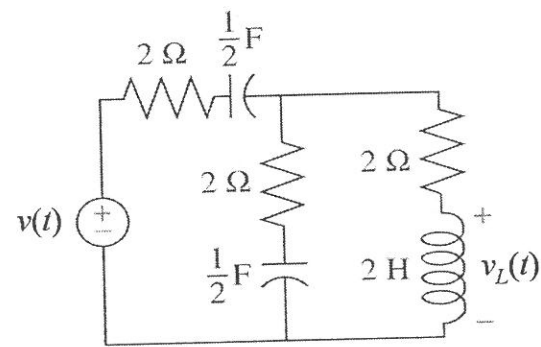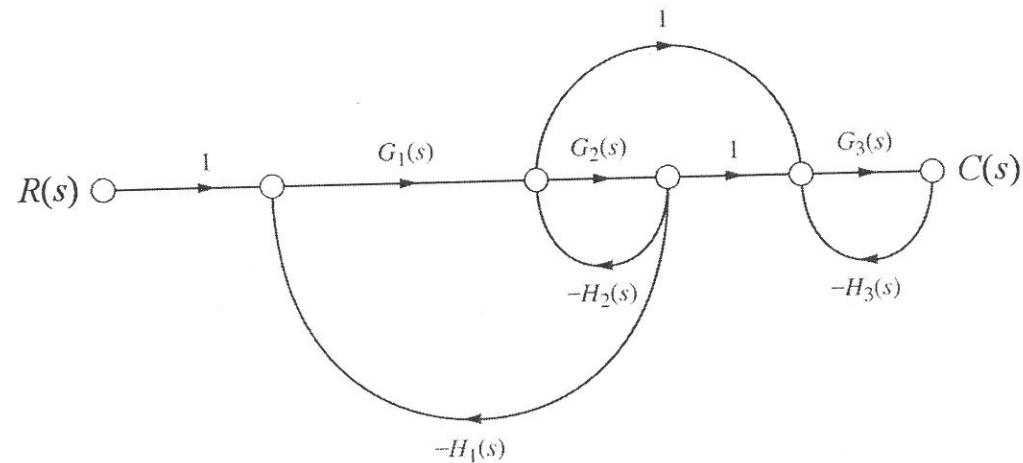
第一節　控制系統　試題（選考）

注意事項：

1. 本試題共 5 題，每題 20 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

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1. Find the transfer function, $G(s) = V_L(s) / V(s)$, of the following electrical network (20%).
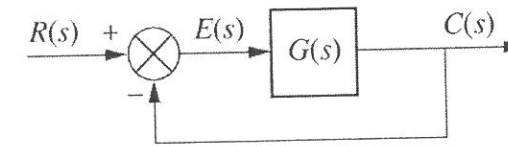

2. Find the transfer function $T(s) = C(s)/R(s)$ of the following system (20%).

3. For the following unity feedback system with $G(s) = \dfrac{K}{(s+10)(s^2+4s+5)}$,

   a) Find the range of K for stability. (10%)
   b) Find the frequency of oscillation when the system is marginally stable. (10%)

4. For the following unity feedback system with $G(s) = \dfrac{10}{s(s+1)(s+2)}$,

   a) Find the steady-state error for a unit step input. (10%)
   b) Find the steady-state error for a ramp input. (10%)
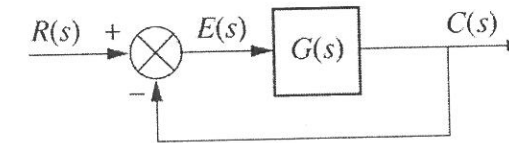
5. Given a unity feedback system with the forward transfer function $G(s) = \dfrac{K(s+2)(s+1)}{(s-1)(s-2)}$,

   a) Sketch the root locus. (10%)
   b) Find the break-in point. (10%)