

系別：機械與機電工程學系

科目：自動控制

准帶項目請打「V」	
✓	簡單型計算機

本試題共 1 頁，4 大題

- (1) Determine the value of  $K$  for  $y(t)$  is 5 as  $t$  go to infinite, when  $x(t)$  is a unit step function. (25%)

$$G(s) = \frac{K}{(s+20)}$$

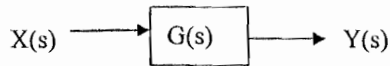


Fig. 1 open loop control system

- (2) Find a suitable range of  $K$  for the system below (Fig. 2), if the overshoot is less than 10 % and the settling time is less than 1 sec for a unit step input. (25%)

$$G(s) = \frac{K}{s((s/12)+1)}$$

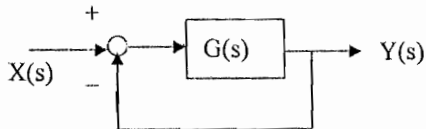


Fig. 2 negative unit feedback control system

- (3) Sketch the root locus for the system block diagram (Fig. 2) and find out the breakaway point. (25%)

$$G(s) = \frac{K(s+10)}{s(s+5)}$$

- (4) Draw the Bode plot of a system with transfer function. (25%)

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