

ECE 356 S/S 00 – Quiz 6

Name:

KEY

Honor Code:

1. (5 points) For each of the following unity-feedback systems with forward loop transfer function  $G(s)$ , find the steady state error when the input is  $r(t)$ .

$$\lim_{s \rightarrow 0} \frac{sR(s)}{1+G(s)}$$

a.  $G(s) = \frac{1}{s+1}, r(t) = u(t)$

1/2

b.  $G(s) = \frac{1}{s^2 + 2s + 1}, r(t) = tu(t)$

$\infty$

c.  $G(s) = \frac{1}{s(s+1)(s+2)}, r(t) = .5t^2u(t)$

$\infty$

d.  $G(s) = \frac{1}{s^2 + 2s + 1}, r(t) = tu(t)$

$\infty$

e.  $G(s) = \frac{1}{(s+2)(s+2)(s+4)}, r(t) = 10u(t)$

160/17

2. (5 points) For each of the following closed loop transfer functions  $T(s)$ , find the steady state error when the input is  $r(t)$ .

$$\lim_{s \rightarrow 0} sR(s)[1-T(s)]$$

a.  $T(s) = \frac{s}{s+1}, r(t) = u(t)$

1

b.  $T(s) = \frac{1}{s^2 + 2s + 1}, r(t) = 10u(t)$

0

c.  $T(s) = \frac{1}{(s+1)(s+2)(s+3)}, r(t) = tu(t)$

$\infty$

d.  $T(s) = \frac{1}{s+1}, r(t) = tu(t)$

1

e.  $T(s) = \frac{1}{(s+1)(s+2)}, r(t) = u(t)$

1/2