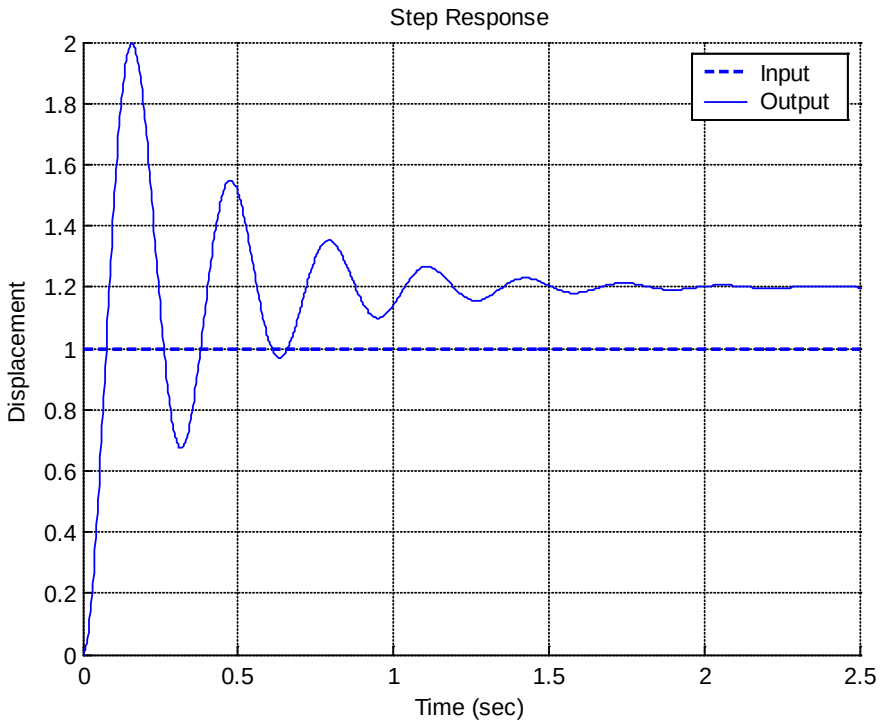
ECE-320 Practice Quiz 2

Problems 1-3 refer to the **unit step response** of a system, shown below



1) The best estimate of the **steady state error** for a **unit step input** is

a) 0.2 b) -0.2 c) 1.0 d) -0.0

2) The best estimate of the **steady state error** for a **unit ramp input** is

a) 0.0 b) 0.25 c) ∞ d) impossible to determine

3) The best estimate of the **percent overshoot** is

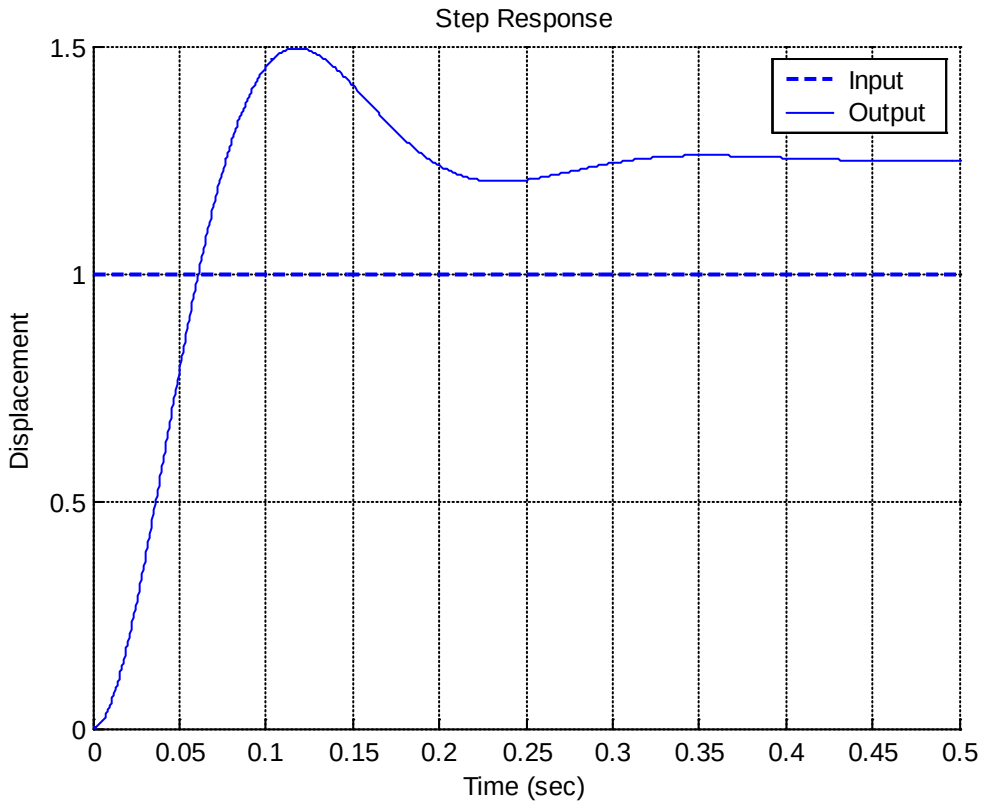
a) 200% b) 100% c) 67% d) 20%

4) The **unit step response** of a system is given by $y(t) = 0.5u(t) - tu(t) - t^4 e^{-t}u(t) + e^{-t}u(t)$

The **steady state error** for a unit step input for this system is best estimated as

a) ∞ b) 0.5 c) 2.0 d) impossible to determine

Problems 5-7 refer to the **unit step response** of a system, shown below



5) The best estimate of the **steady state error** for a **unit step input** is

a) 0.50 b) 0.25 c) -0.25 d) 0.0 e) impossible to determine

6) The best estimate of the **steady state error** for a **unit ramp input**

a) 0.0 b) 0.25 c) ∞ d) impossible to determine

7) The best estimate of the **percent overshoot** is

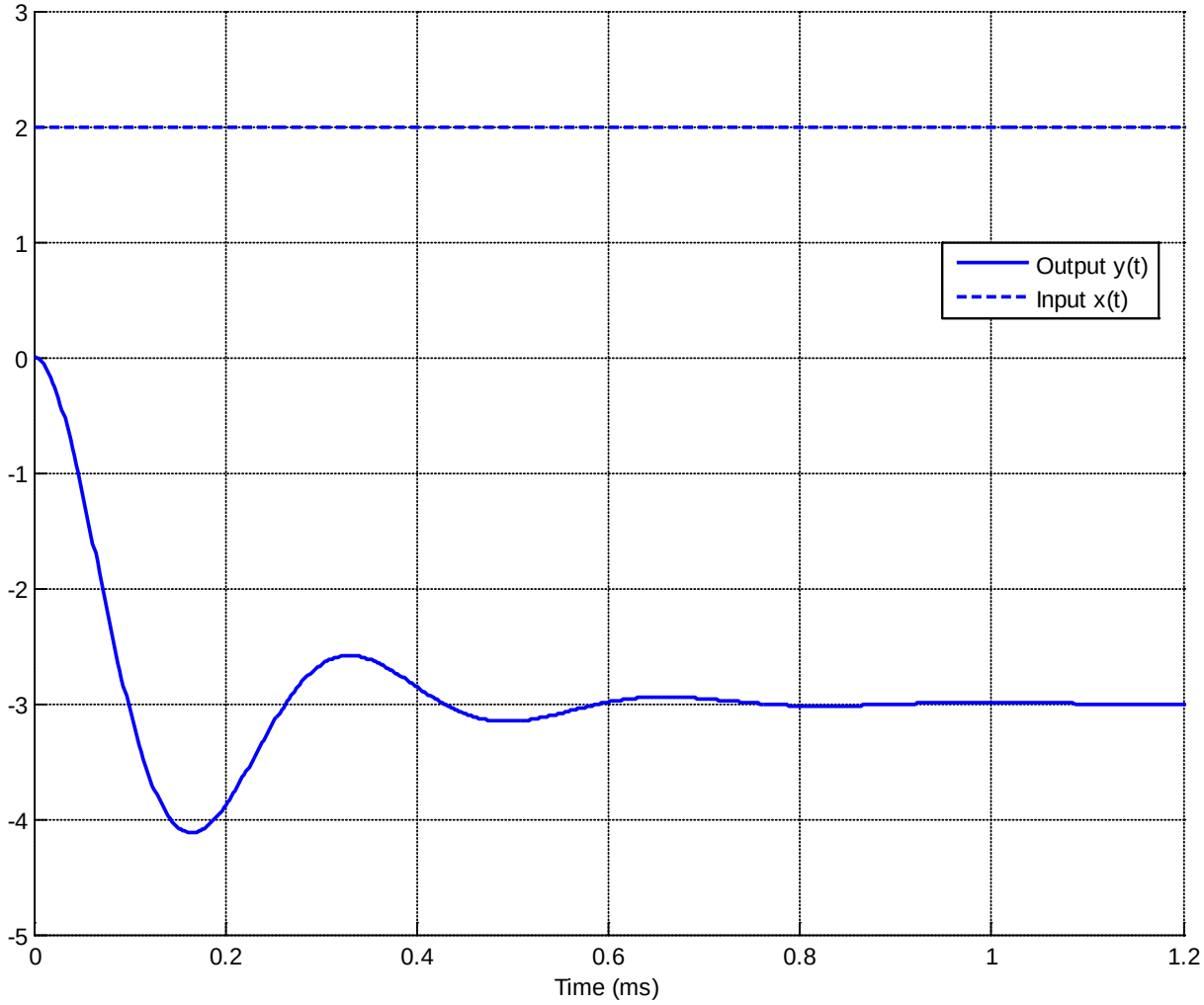
a) 20% b) 50% c) 25% d) 150%

8) The **unit step response** of a system is given by $y(t) = 0.5u(t) - t^4 e^{-t} u(t) + e^{-t} u(t)$

The **steady state error** for a **unit step input** for this system is best estimated as

a) ∞ b) 0.5 c) 2.0 d) impossible to determine

Problems 9 and 10 refer the following graph showing the response of a second order system to a step input.



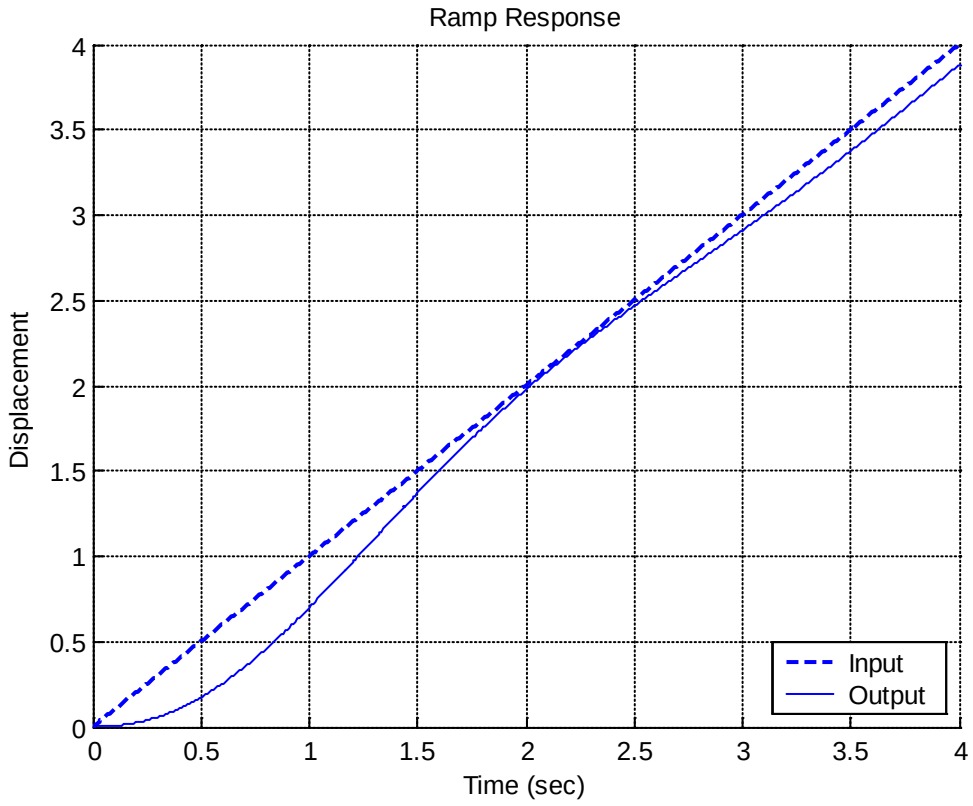
9) The percent overshoot for this system is best estimated as

a) 400% b) -400 % c) 300% d) -300 % e) -33% f) 33%

10) The (2%) settling time for this system is best estimated as

a) 0.3 ms b) 0.6 ms c) 1.0 ms d) 1.2 ms

Problems 11 and 12 refer to the **unit ramp response** of a system, shown below:



11) The best estimate of the **steady state error** is

a) 0.1 b) -0.1 c) 0 d) 0.4 e) -0.4

12) The best estimate of the **steady state error** for a unit step is

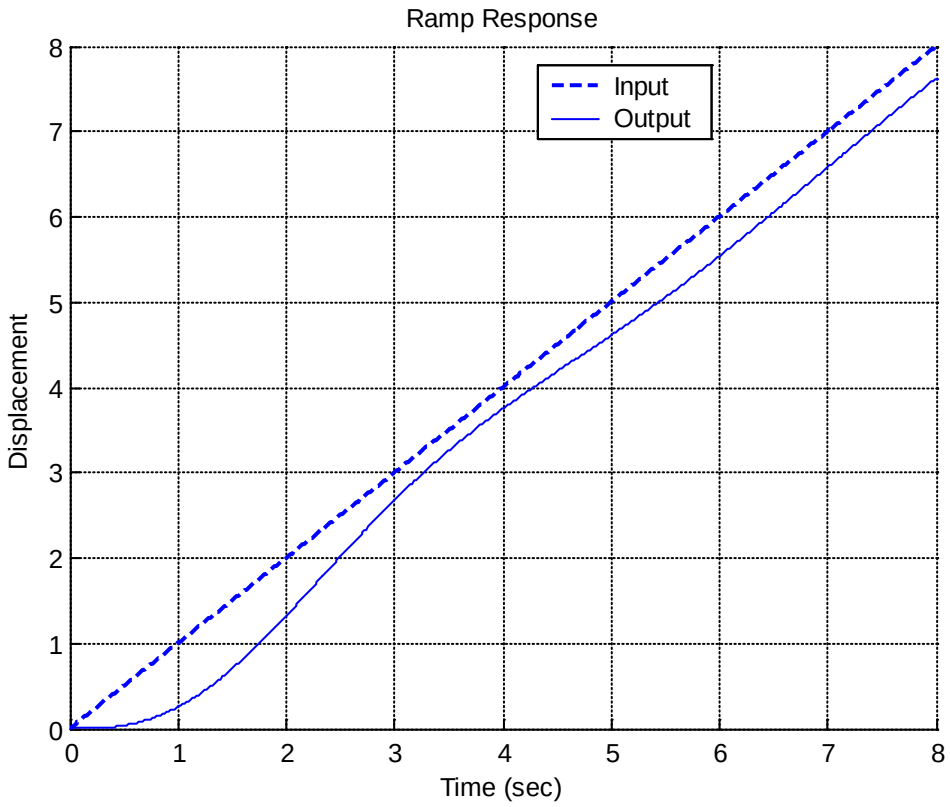
a) 1.0 b) 0.5 c) 0.0 d) ∞

13) The **unit ramp response** of a system is given by $y(t) = -0.5u(t) + tu(t) + e^{-t}u(t)$.

The best estimate of the **steady state error** is

a) 0.5 b) 2.0 c) 1.0 d) ∞

Problems 14 and 15 refer to the **unit ramp response** of a system, shown below:



14) The best estimate of the **steady state error** is

a) 0.8 b) 0.6 c) 0.4 d) 0.2

\15) The best estimate of the **steady state error** for a **unit step input** is

a) 1.0 b) 0.5 c) 0.0 d) ∞

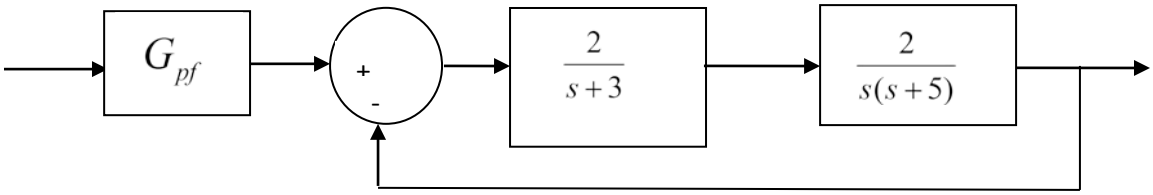
16) The **unit ramp response** of a system is given b $y(t) = -0.5u(t) - 2tu(t) + e^{-t}u(t)$.

The best estimate of the **steady state error** for a **unit ramp input** is

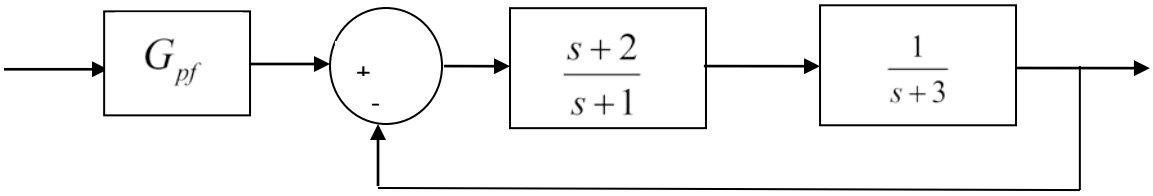
a) 0.5 b) 2.0 c) 1.0 d) ∞

17) For the block diagram below, the value of the prefilter G_{pf} that produces zero **steady state error** for a unit step input is:

a) 1 b) 3/2 c) 3 d) 1/3



Problems 18-20 refer to the following system:



18) Assuming the prefilter G_{pf} is 1, the **position error constant** K_p is best approximated as

a) 2/3 b) 2/5 c) 1 d) 0

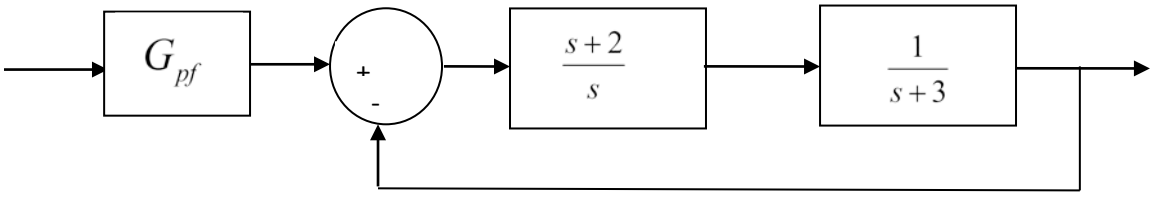
19) Assuming the prefilter G_{pf} is 1, the **steady state error** for a unit step is best approximated as

a) 1/3 b) 3/2 c) 3/5 d) 2/5

20) The value of the prefilter G_{pf} that produces **a steady state error** of zero is:

a) 1 b) 3/2 c) 5/2 d) 1/3

Problems 21-23 refer to the following system



21) Assuming the prefilter G_{pf} is 1, the **velocity error constant** K_v is best approximated as

a) 2/3 b) 2/5 c) 1 d) 0

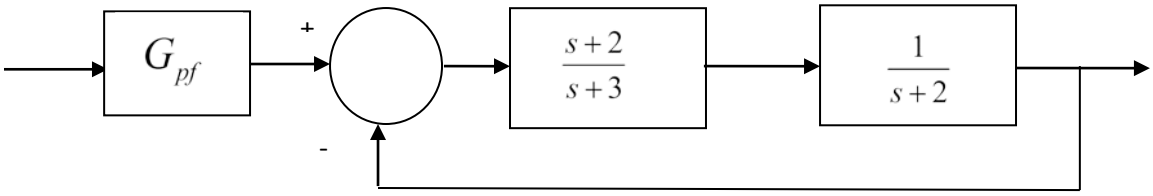
22) Assuming the prefilter G_{pf} is 1, the **steady state error** for a unit ramp input is best approximated as

a) 1/3 b) 3/2 c) 3/5 d) 2/5

23) Assuming the prefilter G_{pf} is 1, the **steady state error** for a unit step input is best approximated as

a) ∞ b) 0 c) 3/5 d) 2/5

Problems 24- 26 refer to the following system:



24) Assuming the prefilter G_{pf} is 1, the **position error constant** K_p is best approximated as

a) 2/3 b) 1/3 c) 1 d) 0

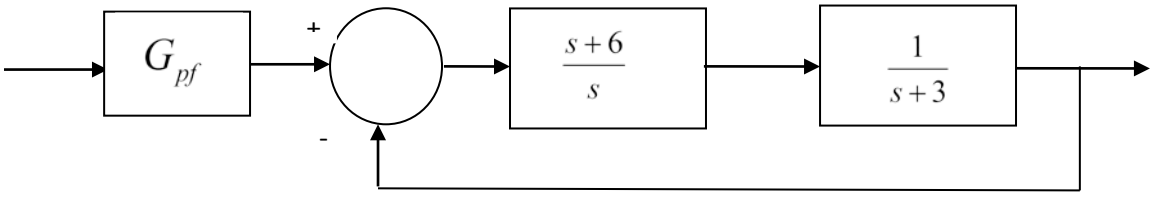
25) Assuming the prefilter G_{pf} is 1, the **steady state error** for a unit step is best approximated as

a) 1/3 b) 2/3 c) 3/4 d) 4/3

26) The value of the prefilter G_{pf} that produces **a steady state error** of zero is:

a) 1 b) 3/2 c) 4 d) 1/3

Problems 27-29 refer to the following system



27) Assuming the prefilter G_{pf} is 1, the **velocity error constant** K_v is best approximated as

a) 2/3 b) 2 c) 1 d) 0

28) Assuming the prefilter G_{pf} is 1, the **steady state error** for a unit ramp input is best approximated as

a) 1/2 b) 3/2 c) 2 d) 2/5

29) Assuming the prefilter G_{pf} is 1, the **steady state error** for a unit step input is best approximated as

a) ∞ b) 0 c) 3/5 d) 2

Answers: 1-b, 2-c, 3-c, 4-a, 5-c, 6-c, 7-a, 8-b, 9-f, 10-b, 11-a, 12-c, 13-a, 14-c, 15-c, 16-d, 17-a, 18-a, 19-c, 20-c, 21-a, 22-b, 23-b, 24-b, 25-c, 26-c, 27-b, 28-a, 29-b