MECH 467 Tutorial 2 – Inverse Laplace Transforms, Final Value Theorem, Block Diagram Algebra

1) Find the response of $y(t)$ of a system $G(s)$ for a given input $r(t)$

Transfer Function $G(s)$	Initial Condition $y(0)$	Input $r(t)$
$\frac{3}{s+3}$	10 (Hint: transform to ode)	6
$\frac{1}{s+10}$	0	$3\cos 10t$
$\frac{-4s+20}{s+300}$	0	10
$\frac{3}{s^2+0.5s+4}$	$y(0) = y'(0) = 0$	2

2) Find the steady state response y_{ss} and steady state error e_{ss} given a system $G(s)$ for a given input $r(t)$

Transfer Function $G(s)$	Input $r(t)$
$\frac{3}{s+3}$	6
$\frac{-4s+20}{s+300}$	10
$\frac{3}{s^2+0.5s+4}$	2
$\frac{3}{s^2+0.5s+4}$	$2t$
$\frac{10}{s^2+3s+10}$	$2t$

3) Find the output as a function of the reference input and disturbance for the block diagram in Figure 1
4) Express the transfer function and the disturbance transfer function for the block diagram in Figure 1

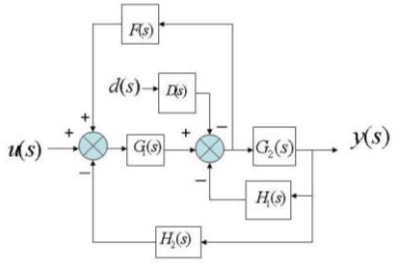

Figure 1