

SOLUTIONS

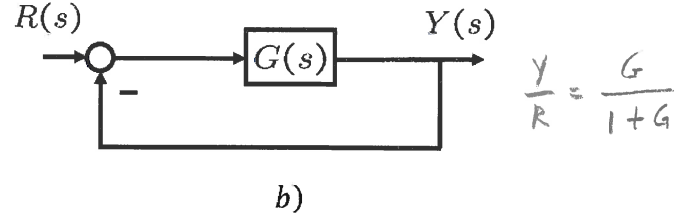
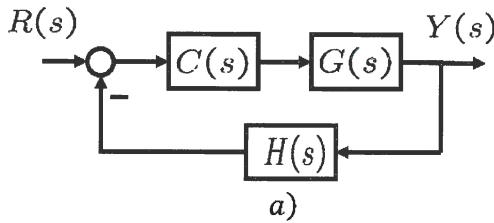
NOTE: ALL THE SOLUTIONS BELOW WERE DERIVED BY INSPECTION

ECE317

HW #2

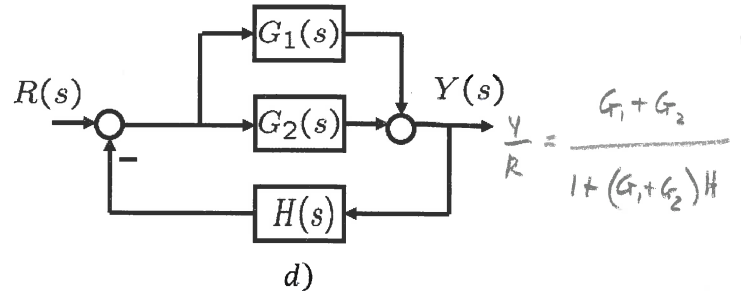
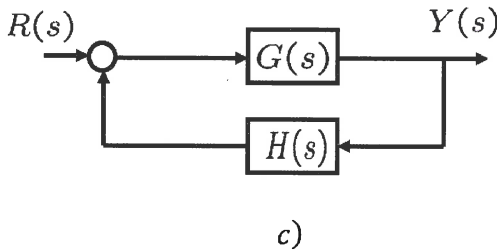
1) Compute transfer functions from $R(s)$ to $Y(s)$ for each of the following four block diagrams:

$$\frac{Y}{R} = \frac{CG}{1+CGH}$$



$$\frac{Y}{R} = \frac{G}{1+G}$$

$$\frac{Y}{R} = \frac{G}{1-GH}$$

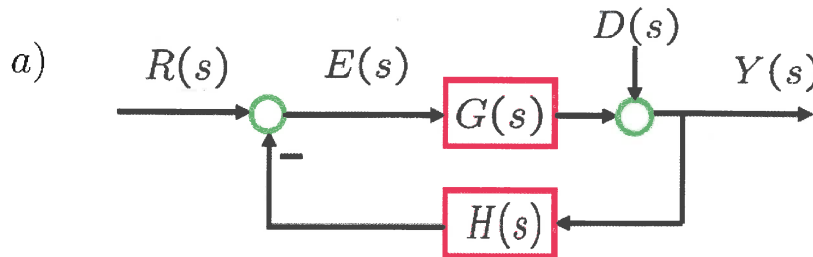


$$\frac{Y}{R} = \frac{G_1 + G_2}{1 + (G_1 + G_2)H}$$

2) Compute transfer functions from $R(s)$ to $Y(s)$ and also from $D(s)$ to $Y(s)$ for the following three block diagrams:

$$\frac{Y}{R} = \frac{G}{1+GH}$$

$$\frac{Y}{D} = \frac{1}{1+GH}$$



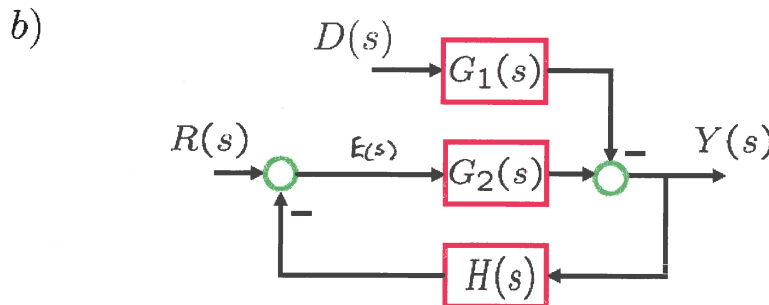
ALSO

$$\frac{E}{R} = \frac{1}{1+GH}$$

$$\frac{E}{D} = -\frac{H}{1+GH}$$

$$\frac{Y}{R} = \frac{G_2}{1+G_2H}$$

$$\frac{Y}{D} = -\frac{G_1}{1+G_2H}$$

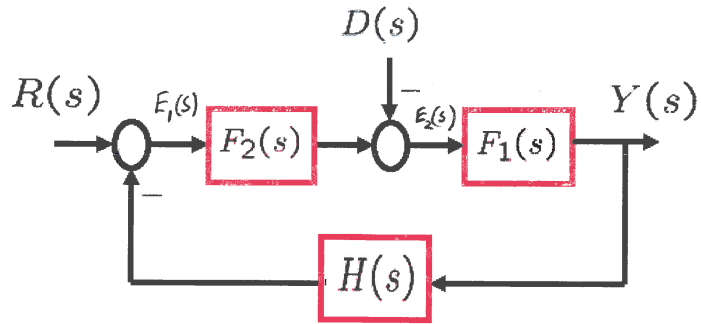


ALSO

$$\frac{E}{R} = \frac{1}{1+G_2H}$$

$$\frac{E}{D} = \frac{G_1H}{1+G_2H}$$

c)



$$\frac{Y}{R} = \frac{F_1 F_2}{1 + F_1 F_2 H}$$

$$\frac{Y}{D} = - \frac{F_1}{1 + F_1 F_2 H}$$

Also

$$\frac{E_1}{R} = \frac{1}{1 + F_2 F_1 H}$$

$$\frac{E_2}{R} = \frac{F_2}{1 + F_2 F_1 H}$$

$$\frac{E_1}{D} = \frac{F_1 H}{1 + F_2 F_1 H}$$

$$\frac{E_2}{D} = - \frac{1}{1 + F_1 F_2 H}$$