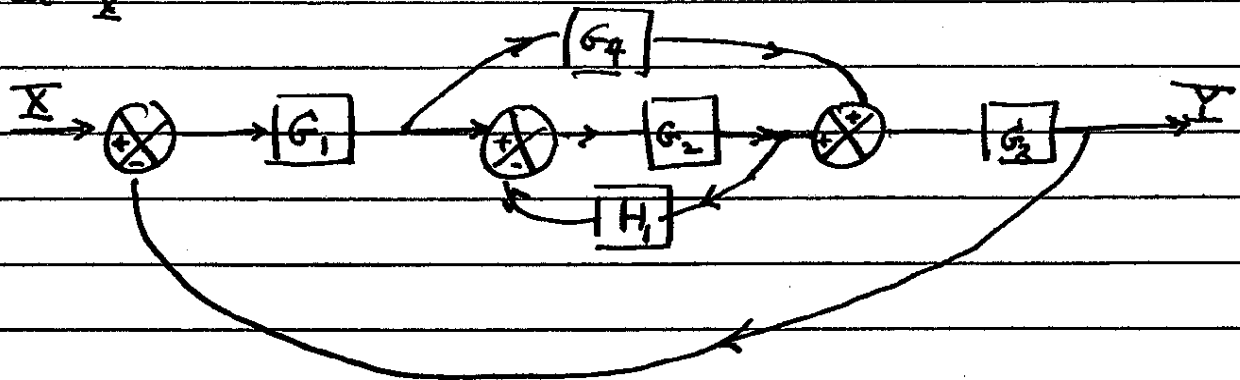


1. Find  $\frac{Y}{X}$



2. Consider the system

$$x_1 = a_{11} x_1 + a_{12} x_2 + u_1$$

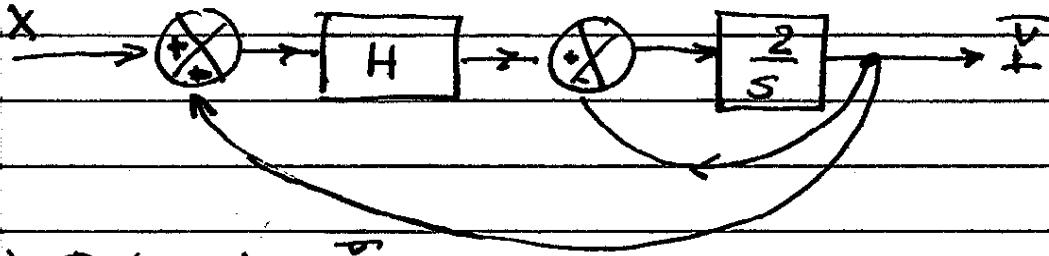
$$x_2 = a_{21} x_1 + a_{22} x_2$$

(a) Draw the SFG and determine

$$\frac{x_1}{u_1} \text{ and } \frac{x_2}{u_2}$$

(b) How does your result compare to the solution obtained via direct calculation

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a) Determine  $\frac{Y(s)}{X(s)}$

b) Given  $e(t) = x(t) - y(t)$  determine  $H(s)$   
such that  $e(\infty) = \frac{1}{2}$  when  $x(t) = tu(t)$