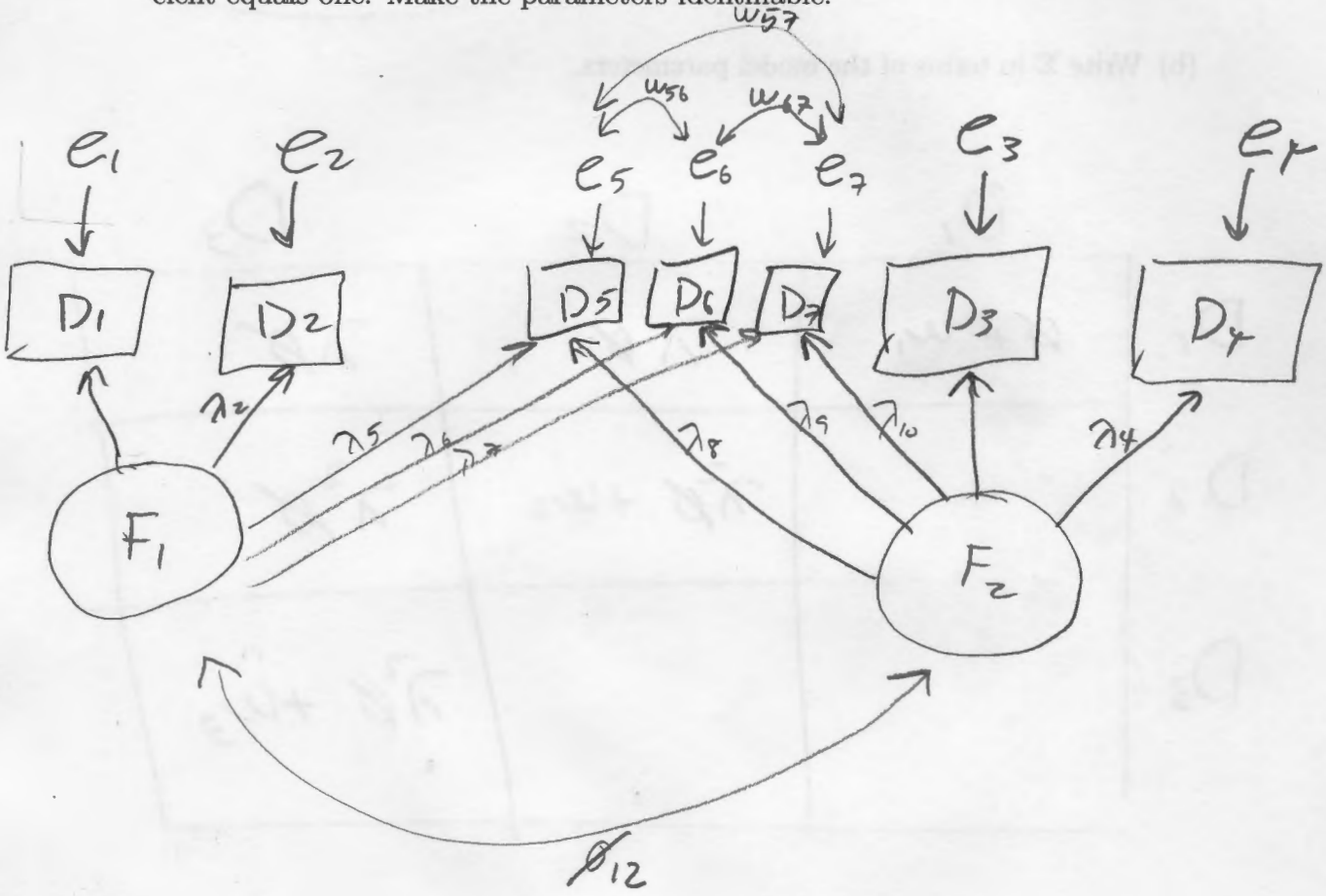
Name Jerry

Student Number _____

STA 431 S2017 Quiz 11

1. (5 points) Make a path diagram with two *unstandardized* factors and seven observed variables that illustrates both the four-variable two-factor rule and the crossover rule. Write symbols on the arrows. If an arrow does not have a symbol it means the coefficient equals one. Make the parameters identifiable.



2. (5 points) Let

$$\begin{aligned} D_1 &= F + e_1 \\ D_2 &= \lambda F + e_2 \\ D_3 &= \lambda F + e_3 \end{aligned}$$

where e_1, e_2, e_3, F are all independent, $Var(e_j) = \omega_j$, $Var(F) = \phi$ and $\lambda \neq 0$.

(a) What are the degrees of freedom of the chi-squared goodness of fit test for this model? The answer is a number.

5 parameters, 6 equations, so $df = 1$

(b) Write $\boldsymbol{\Sigma}$ in terms of the model parameters.

	D_1	D_2	D_3
D_1	$\phi + \omega_1$	$\lambda\phi$	$\lambda\phi$
D_2		$\lambda^2\phi + \omega_2$	$\lambda^2\phi$
D_3			$\lambda^2\phi + \omega_3$

(c) Give the model-induced equality constraint or constraints on the σ_{ij} values. This is the null hypothesis of the goodness of fit test.

$\sigma_{12} = \sigma_{13}$