STA 312F07 Quiz 5

Let the model for a single observation (one of n independent and identically distributed observations) be

$$\begin{aligned} Y_1 &= \gamma_1\xi + \zeta_1 \\ Y_2 &= \gamma_2\xi + \zeta_2 \\ X &= \xi + \delta, \end{aligned}$$

where δ, ξ, ζ_1 and ζ_2 are all independent normals with expected value zero, $Var(\xi) = \phi$, $Var(\zeta_1) = \psi_1$, $Var(\zeta_2) = \psi_2$, $Var(\delta) = \theta_\delta$, and the regression coefficients γ_1 and γ_2 are fixed constants. ξ is a latent variable.

1. Give the covariance matrix of the observed variables X, Y_1 and Y_2.
2. What are the parameters of this model? That is, give the parameter vector θ.
3. Is this model identified? Answer Yes or No and prove your answer.

Total Marks = 10 Points