Prelim Exam #2, **AOE 5784, Model-Based Estimation & Kalman Filtering** Fall 2022

Exam rules: Do all problems. Hand in completed exam by due date and time, by submitting a single .pdf file to the Canvas assignment site. No collaboration or consultation is allowed with any other humans except Prof. Psiaki. He is willing to talk about problems if available. You may use (inanimate) outside sources (e.g. books). If you use such sources, then list them.

[15 pts] Problem 4-6 in Bar-Shalom.

Hints: You may assume that $t \geq \tau$ without loss of generality. You must express your answer using $P_{xx}(t_0)$, but you may want to first derive the answer in terms of P_{xx} at a different time.

[20 pts] Problem Set 5, Number 1.

[15 pts] Problem Set 5, Number 4, except use Qk = 40.0 instead of Qk = 4.0. This means that you also will have to re-run your code for Problem 3 in order to re-compute its time-varying estimation error covariance matrix for purposes of comparison with the result from Problem 3.

[15 pts] Problem 5-1.1 in Bar-Shalom.

[15 pts] Problem 5-11 in Bar-Shalom.

[20 pts] Problem Set 6, Number 4.