PART 5

Since the control of flaperon was disabled, so the output has variantion by only changing input2. So at first trial, set the full state feed back gain F=[1,2,3,4,5;0,0,0,0,0] and test the system, Use input 2 is sinusoid with zero input 1. However, the responses still changing with the time varying input. Then set elements related to input 2 in B to be zero. Then we got a time unvarying response to sinusoid input.

For least porfomance, it will be better to let the transfer function of new system getting closer to old one. So use

Part 6 – Design an observer for the system (either full-state or reduced order) using output measurements of pitch rate and pitch attitude. Make sure that your observer dynamics is at least five times faster than your system dynamics.

A reduced order is designed below. Since the second and third state could be measured, the state-space model need to be manipulated as below





The pole of fast mode of dynamic system is -18, and the observer dynamics should not less than five times the fast mode for system dynamics. So choose the pole of observer to be -90,-91,-92.