Your Report should include:

A. Aircraft parameters and flight condition.

B. Aircraft non-dimensional stability derivatives.

C. Longitudinal Flight Dynamics:

1. Longitudinal state space model for aircraft linearized equations of motion.
2. Eigenvalues, eigenvectors, short-period mode characteristics (undamped natural frequency, damping ratio, settling time, etc.), and long period mode characteristics.
3. Transfer functions for longitudinal modes.
4. Aircraft states response for initial disturbance; and elevator and throttle inputs.
5. Repeat (1) to (4) for longitudinal modes approximations.
6. Compare all the results, characteristics, and responses of the approximated modes with the linearized longitudinal modes.
7. Repeat (1) to (6) for lateral modes.
8. Analyze, comments, and discuss the results.

D. Lateral Flight Dynamics:

1. Repeat the requirements from (1) to (8) of **C** for Lateral flight dynamics and its approximations.

E. Longitudinal Autopilots:

1. Drive necessary longitudinal autopilots state-space model and its transfer functions.
2. Choose appropriate controller gain to enhance aircraft responses longitudinal modes.
3. Show aircraft longitudinal states response before and after applying the controller.

F. Lateral Autopilots:

1. Repeat the requirements of **E** for lateral autopilots.