

1. Explain what the physical processes behind induced drag and parasite drag experienced by finite wings are. (10%)
2. What are the problems associated with an aircraft with insufficient directional stability? How to improve it? (10%)
3. What is the adverse yaw? How to alleviate it? (10%)
4. What is the aileron reversal? How to avoid it? (10%)
5. Comparing the difference between the leading edge and trailing edge high lift coefficient devices on the wing lift coefficient. Give sketches on the C_L versus α curve to show their major differences. (10%)
6. What is the definition of the angle of attack of stall? What is the definition of the speed of stall? How are both of them related? (10%)
7. What is the definition of critical Mach number for a high subsonic aircraft? How does it affect the cruise speed of a high subsonic aircraft? (10%)
8. At high altitude and high speed, a turbofan engine has larger maximum thrust than at low altitude and low speed. Is that correct? Why? (10%)
9. What are the two principal categories of navigation? Give at least an example for each category, respectively. (10%)
10. For the same surface area, the weight of high aspect ratio wing is less than that of low aspect ratio wing. Is that correct? why? (10%)