

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. What are the definition for absolute ceiling and service ceiling? (5%)
2. (a) Write down two types of drag acting on an aircraft and explain what are they? (5%)
(b) Give sketch of these two drag curves and total drag curve versus flight velocity, and show the position of minimum drag and its relation to the other two types of drag. (5%)
3. Draw (and label) the forces acting on an airplane in landing-descending flight. Write two equations which must be satisfied for equilibrium. (10%)
4. Give sketches of the lift coefficient curves vs. angle of attack in same graph for:
 - (a) Cambered airfoil. (5%)
 - (b) Cambered airfoil with leading edge flap. (5%)
 - (c) Cambered airfoil with trailing edge flap. (5%)
5. What are the Helmholtz's theorems and Kelvin's circulation theorem in fluid mechanics? (10%)
6. (a) What is a turbofan engine and how does a turbofan engine work? (10%)
(b) What is a turbojet engine and how does a turbojet engine work? (10%)
(c) What is the difference between a turbofan and turbojet engine? (6%)
7. (a) What is the stall speed of an aircraft? (9%)
(b) Briefly describe at least three critical situations which cause airplane crashes. (15%)