※ 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。

Part 1:

1. (25%) What is the main and secondary flight control surfaces (devices) used in conventional civil airplanes? Please describe their major functions concisely.

2. (25%)

(a) In modern aircraft design, what are the major considerations for selecting structural materials?

(b) What are the major types of *composite materials* used in aircraft structures and what are their advantages?

3. (10%)

Consider the Northrop F-5 fighter airplane, which has a wing area of 170 ft^2 . The wing is generating 18,000 lb of lift. For a flight velocity of 250 mi/h at standard sea level, calculate the lift coefficient. (Note: 1 mi/h=88/60 ft/s)

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Part 2: 答案卷請註明 每一題的題號及答案。(每一空格兩分，總共四十分。)

1. The four major forces components acting on an aircraft in cruising
    are _____, _____, _____, and _____.

2. The major geometric parameters for defining an airfoil are: _____, _____, _____,
    and _____.

3. The four major geometric parameters for defining a wing are: _____, _____, _____,
    and _____.

4. The mathematical form of the dynamic pressure can be shown as _____, and the unit in SI system of it
    is _____.

5. The definition in mathematical form of lift coefficient and pressure coefficient are

    _____ and _____.

6. The definition of Reynolds number is _____ and the Mach number is _____.

7. There are two major types of drag forces acting on a wing which are _____
    and _____.