# Autoevaluation test.
# Chapter 1.

1. **Define the Phases of structural design**

- Specification of function an design criteria
- Determination of applied load
- Calculation of internal element loads
- Determination of allowable element strength
- Experimental test

2. **Explain the differences between surface and body loads.**

Surface forces are those that act on a surface. Body loads are those that act throughout a volume by a long-range interaction with matter or charges at a distance

3. **Explain the necessity of introduce a safety factor in structural design.**

- Limitations of calculus model
- Variation in physical properties of materials
- Variation in fabrication standard
- Emergency conditions
- Variation of loads (gust random

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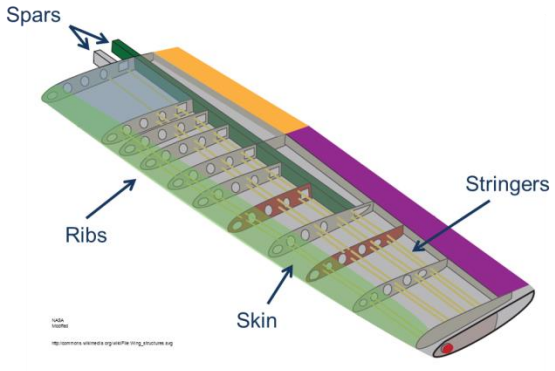
**4. Describe the elements of a cantilever wings.**

The principal structural parts of the wing are spars, ribs, and stringers




Principal structural elements of the wing

**5. Explain the main functions of the ribs in a wing.**

Ribs give the wing section its shape and support in-plane loads. They transmit the load applied to the wing, from the skin to the spars. Also, ribs reduce the buckling length of the stringers and spars.

**6. List the loads applied on the fuselage**

- Wing reactions
- Landing gear reactions
- Internal pressure

**7. List the Fuselages types**

**Non stressed-skin structures**

- Truss fuselage
- Geodetic fuselage

**Stressed-skin Structures**

- Corrugated (3)
- Monocoque fuselage
- Semi-Monocoque fuselage

**8. Describe the advantages and disadvantage of the Geodetic fuselage design**

**Advantages:**

Lightweight structure

High strength

Damage tolerance

**Disadvantages:**

Complexity

**9. Explain the differences in stabilizer design between civil and military aircraft (fighters).**

In fighter design, usually no spar + ribs construction is used

**10. Explain the differences between conventional a T-tail design.**

The span of the t-tail fin is aprox. 1/3 than conventional tail

The vertical stabilizer must be made considerably stronger and stiffer to support the forces generated by the tailplane