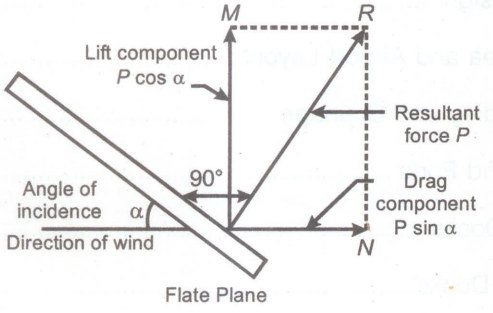
1. AIRCRAFT CHARACTERISTICS AND PLANNING

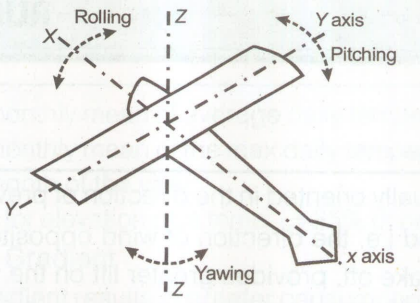
AEROPLANE COMPONENT PARTS

- Engine
  - (i) **Piston engine:** is driven by propeller.
    Suitable to operate at low altitudes and moderate speeds.
  - (ii) **Turbojet:** efficiency is higher at high altitudes owing to the drop in the atmospheric density and greater temperature difference through the turbine.
  - (iii) **Turbo Prop:** performs well at low altitudes as well as high altitude.
  - (iv) **Ram jet:** no moving parts, must be operated at high speed.
  - (v) **Rocket engine:** no limit on altitude since oxygen in the atmosphere is not relied upon for combustion. Engine carries its own supply of oxygen.
- Fuselage
  - main body of the aircraft
  - provides for power plant, fuel, cockpit, passengers, cargo etc.
- **Wings:** The purpose of an aircraft wing is to support the machine in the air when the engine has given it the necessary forward speed.



NOTE As the angle of incidence increase, the drag component also increases and the lift component reduces.

- Three control



  - The movement of aircraft about the *X*-axis is called rolling movement.
  - The movement about y and z axes are called pitching and yawing movements respectively.
  - **Elevator:** controls the pitching or up and down movements of the aircraft.
  - **Rudder:** It is used for turning or yawing movement of the aircraft.
  - **Aileron:** It is used to control of rolling movement about longitudinal axis.

AIRPORT PLANNING

- The regional plan usually provides the following information:
  1. Approximate locations of the airports in national map.
  2. Classification of airports
  3. Location of air strips
  4. Routes of air Travel.
- Following data is collected for regional planning:
  1. Population
  2. Topographical and geographical features
  3. Existing airports in the vicinity
  4. Air traffic characteristics
- Minimum spacings from existing airports:
  - (i) for Airports serving small general aviation aircrafts under VFR conditions = 3.2 km (2 Miles)
  - (ii) for airports serving bigger aircrafts under VFR conditions = 6.4 km (4 Miles)
  - (iii) for airports operating piston engine aircrafts under IFR conditions = 25.6 km (16 Miles)
  - (iv) for jet aircrafts under IFR conditions = 160 km (100 Miles)

  The best location is a site adjacent to the main highway.

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