

What are Quadcopters?

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About Quadcopters:

- It is an **unmanned aerial vehicle (UAV)** or drone **with four rotors, each with a motor and propeller.**
- A quadcopter can be **manually controlled or can be autonomous.**
- It's also **called a quadroter helicopter or quadroter.**
- **It belongs to a more general class of** aerial vehicles called **multicopter or multicopter.**
- **Principle:**
 - **The main principle** behind the flight of a quadcopter **is Newton's Third Law of motion**, which states that **for every action there's an equal and opposite reaction.**

- A quadcopter's **propellers push air downwards**. This **causes an opposite reaction called thrust** that pushes the quadcopter upwards against gravity.
- **Air movement comes from Bernoulli's Principle**, with larger propeller blades and faster rotation creating more thrust.
- **When the propellers rotate (for example clockwise), the quadcopter will tend to rotate anti-clockwise. Rotational force is called torque.** Helicopters solve this by using a tail rotor.
- **Quadcopters solve this by driving two diagonal propellers clockwise and the other two anti-clockwise.** Thus, torque from one pair cancels that of the other.
- When each diagonal pair of propellers rotate in opposite directions, **their thrusts will be in opposite directions. The quadcopter will not be able to lift up** or fly.
- **This is solved by having the blades of each diagonal pair of propellers shaped as mirror images of the other pair.** Effectively, all propellers will push air downwards regardless of the direction of rotation.

- **Applications:**

- They provide **stable flight performance**, making them **ideal for surveillance and aerial photography**.
- Quadcopters, after being airborne, **have the ability to hover in place**, whereas fixed-wing aerial drones have to be on the move constantly.
- Other application areas include **delivery, land surveys, crop assessment, weather broadcasting**, and more.
- **Quadcopters are an important part of future transportation called Advanced Air Mobility (AAM).**

Q1) What is Bernoulli's Principle?

In fluid dynamics, Bernoulli's principle states that an increase in the speed of a fluid occurs simultaneously with a decrease in pressure or a decrease in the fluid's potential energy. The principle is named after Daniel Bernoulli, a swiss mathematician, who published it in 1738 in his book Hydrodynamics.

Source: [Manipur Factions Deploy Quadcopters](#)

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