Biology Notes: Osmosis & Diffusion (O Level)

Topic: Osmosis

✅ Definition:

Osmosis is the net movement of water molecules from a region of higher water potential to a region of lower water potential, across a partially permeable membrane.

✅ Key Points:

- Involves only water molecules.
- Requires a partially permeable membrane.
- Passive process (no energy required).
- Water moves down the concentration gradient.

✅ Real-life Examples:

- Root hair cells absorbing water from the soil.
- Rehydration of dried fruits in water.
- Water moving into red blood cells (can cause them to burst - lysis).

✅ Osmosis in Plants:

- Water enters vacuole, cell becomes turgid (firm).
- If placed in concentrated solution, plant cell loses water → becomes flaccid/plasmolysed.

Topic: Diffusion

✅ Definition:

Diffusion is the net movement of particles from an area of higher concentration to an area of lower concentration, down a concentration gradient.

✅ Key Points:

- Can occur in gases and liquids.
- No membrane needed (but can occur across one).
- Passive process (no ATP required).

✅ Examples in Biology:

- Oxygen diffusing from alveoli into blood capillaries.
- Carbon dioxide diffusing out of cells.
- Perfume particles spreading in a room.

✅ Factors Affecting Diffusion Rate:

- Temperature (↑temp = faster diffusion)
- Surface area (↑SA = faster)
- Concentration gradient
- Distance (↓distance = faster)