



**CHEMISTRY ONLINE**  
— **TUITION** —

Phone: +442081445350

[www.chemistryonlinetuition.com](http://www.chemistryonlinetuition.com)

Email: [asherrana@chemistryonlinetuition.com](mailto:asherrana@chemistryonlinetuition.com)

# BIOLOGY

## FOUNDATIONS IN BIOLOGY

Level & Board	OCR (A-LEVEL)
TOPIC:	BIOLOGICAL MOLECULES - WATER
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	07
TOTAL MARKS	/27

**ChemistryOnlineTuition Ltd reserves the right to take legal action against any individual/ company/organization involved in copyright abuse.**

## **Biological Molecules – Water - 1**

1.

(a) D

2.

(a) Hydrogen

(b)

Molecules are polar

Polarity enables water molecules to attract / bind to solute molecules.

(c)

Hydrogen ions used to affect / regulate pH

Sodium ions used to regulate water potential

3.

(a)

Ice is less dense than water / floats

Ice provides habitat for some species / AW

Floating ice insulates water below

Aquatic animals / gametes / spores, can move or oxygen / nutrients / resources / AW can circulate

Water is similar density to living organisms

Organisms can float.

4.

(a)

Good solvent

High specific heat capacity / temperature stability

**OR**

Described

High density so frog floats / buoyant

Ice is less dense than water.

**(b)** Water is not considered as biomolecules because. Water has inorganic materials. Water has organic materials. Biomolecules includes the molecules that contain carbon in living tissues.

**5.**

**(a)** This review shows that water in biological systems is not just a passive liquid solvent but also a partner in the formation of the structure of proteins, nucleic acids and their complexes, thereby contributing to the stability and flexibility required for their proper function.

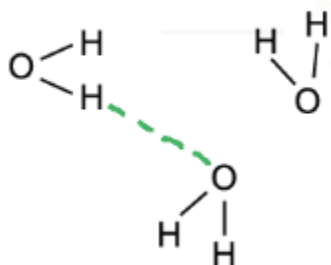
**(b)** Broad biological functions of water include its action as a transport medium for nutrients and waste products, a medium for chemical reactions, cellular osmoregulation and maintenance of cell turgidity, body temperature regulation, lubrication, pH regulation and the formation of pH buffers.

**(c)** The chemical bond present in a water molecule is covalent bond because one oxygen atom shares its two electrons with two hydrogen atoms.

**6.**

**(a)** Water's lower density in its solid form is due to the way hydrogen bonds are oriented as it freezes. Specifically, in ice, the water molecules are pushed farther apart than they are in liquid water. That means water expands when it freezes.

**(b)**



I am Sorry !!!!!

7.

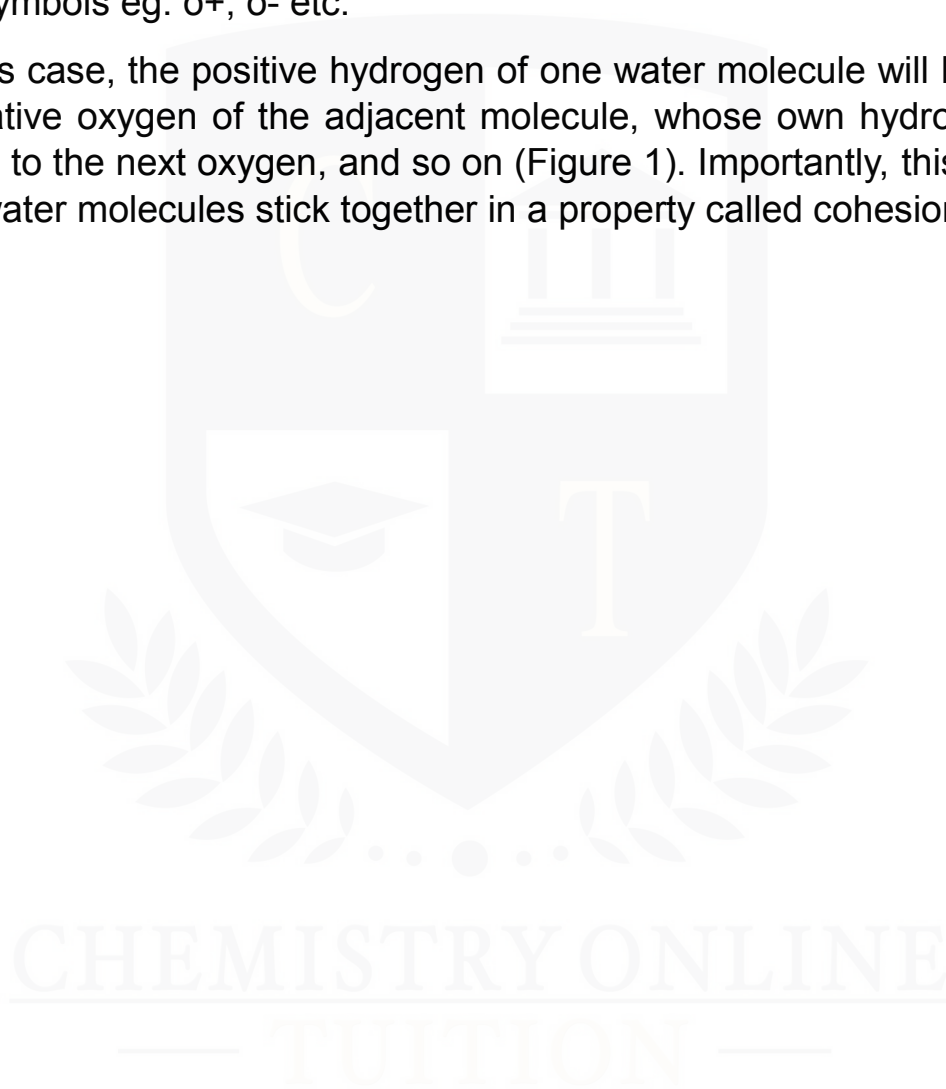
**(a)** Polar, in the context of water molecules, means:

The molecules have two distinct ends / areas / characters

The slightly negative charge at one 'pole', slightly positive at the other

Use of symbols eg.  $\delta+$ ,  $\delta-$  etc.

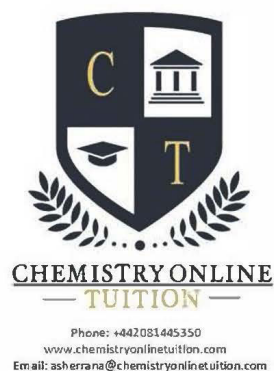
**(b)** In this case, the positive hydrogen of one water molecule will bond with the negative oxygen of the adjacent molecule, whose own hydrogens are attracted to the next oxygen, and so on (Figure 1). Importantly, this bonding makes water molecules stick together in a property called cohesion.



I am Sorry !!!!!



**DR. ASHAR RANA**



- Founder & CEO of Chemistry Online Tuition Ltd.
- Tutoring students in UK and worldwide since 2008
- Chemistry, Physics, and Math's Tutor

---

## CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION

- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: [www.chemistryonlinetuition.com](http://www.chemistryonlinetuition.com)
- Email: [asherrana@chemistryonlinetuition.com](mailto:asherrana@chemistryonlinetuition.com)
- Address: 210-Old Brompton Road, London SW5 OBS, UK