

**Democratic and Popular Republic of Algeria Ministry of Higher Education and Scientific Research
University of Oum El Bouaghi**

Institute: Management of urban techniques

Module: *Psychology* Date: *16/5* 2026 Duration: 1 Hour 30 Minutes

Level: First-Year Licence . Semester: 02. Correction

Question 1 (4 Points)

a) (2 points) The hydrologic cycle is defined as the set of reservoirs and fluxes that hold and move water through the atmosphere, on the surface, and in the subsurface of the Earth.

b) (2 points)

The zone of aeration (vadose zone) is the upper layer of soil and rock where pore spaces contain mainly air and some water.

The saturated zone is the layer below where all pore spaces are completely filled with water.

The water table is the boundary that separates the zone of aeration from the saturated zone.

Question 2 (4 Points)

a) (1 point)

Hydrogeology is the science that studies the occurrence, distribution, and movement of water underground, the laws governing it, and the characteristics of aquifers that store this water, including the chemical, physical, and biological characteristics of groundwater.

b) (2 points) Groundwater processes include:

1. Recharge, 2. Infiltration and percolation, 3. Groundwater flow, 4. Storage, 5. Discharge, 6. Evapotranspiration, 7. Geochemical processes

c) (1 point)

Porosity is the total volume of voids in a rock.

Effective porosity represents only the interconnected voids from which water can be drained by gravity.

Question 3 (5 Points)

b) types of aquifer (4 points)

transition	Importance	Permeability and transmission	Location
Unconfined aquifer – Confined aquifer preached	Local aquifer Regional aquifer – Transferential aquifer –	Aquifer Aquiclude Aquitard aquifuge	Alluviale Hgi plaine

Question 4 (4 Points)

a): Testing water quality is important because it ensures water is safe for drinking, protects wildlife and aquatic ecosystems, and allows early detection of pollution to protect water resources.

b) water quality parameters (2 points)

Total Dissolved Solids (TDS): The measure of the combined content of inorganic and organic substances dissolved in water, such as minerals, salts, metals, and organic matter.

Turbidity: The measure of water clarity caused by suspended particles such as clay, silt, organic matter, and microorganisms.

pH: A logarithmic measure of the acidity or alkalinity of water, ranging from 0 to 14, where 7 is neutral.

Dissolved Oxygen (DO): The amount of oxygen gas dissolved in water, which is essential for aquatic organisms.

Question 5

Sources of pollution (2 Points)

Urban Pollution	Agricultural Activities
Stormwater runoff containing heavy metals and microplastics Combined sewer overflows releasing untreated wastewater	Fertilizer runoff causing nutrient loading Pesticide drift contaminating water

Question 6 (4 Points)

a) What is a watershed and why is it important? (1 point)

A watershed is a geographical area where all surface and groundwater flow toward a single outlet. It is considered the most relevant scale for water management because all interactions between water, soil, atmosphere, ecosystems, and human activities occur within this unit.

b) Four steps of the risk assessment approach (2 points)

- Hazard Identification** – determining which pollutants are present.
- Dose-Response Assessment** – evaluating the toxicity of pollutants.
- Exposure Assessment** – determining how humans or ecosystems may be exposed.
- Risk Characterization** – combining exposure and toxicity to determine the level of risk.

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Teacher : Agaguena Siham

Question 1: (3 Points)

- a) Define the **hydrologic cycle** (1.5points)
- b) Explain the difference between the **zone of aeration (vadose zone)** and the **saturated zone**.
Where is the **water table** located in relation to these zones? (1.5 points)

Question 2: (4 Points)

- a) Define **hydrogeology** . (1 point)
 - a) List **groundwater processes** that govern the movement of underground storage. (2 points)
 - b) What is the difference between **total porosity** and **effective porosity**? (1 point)

Question 3: (4 Points)

- a) Define an **aquifer** (1. points)
- b) list the types of aquifers (3 points)

Question 4: (4 Points)

- a) Why is testing water quality important? (1points)
- b) Define the following **water quality parameters** and explain what each measure:
 - Total Dissolved Solids (TDS), Turbidity, PH, Dissolved Oxygen (DO)

Question 5: (2 Points)

- a) Identify **two sources of pollution** for each of the following categories: (2 points)
 - Urban zone, Agricultural Activities

Question 6: (4 Points)

List the steps of the risk assessment approach (4 points)

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