



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF ENVIRONMENTAL SCIENCE AND RESOURCE MANAGEMENT**  
Plot 91, Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja  
**2024 1 EXAMINATION**

**COURSE CODE: ESM 423**

**COURSE TITLE: Hydrology and Water Resources**

**CREDIT: 2 Units**

**TIME ALLOWED: 2½ Hours**

**Instruction:** Attempt question number ONE (1) and any other TWO (2) questions. Question number one (1) carries 30 marks, while the other questions carry equal marks (20) each.

**QUESTION 1** a. Enumerate the contributions of Leonardo da Vinci to the development of hydrology.

b. State the 18<sup>th</sup> century hallmark in the growth of hydrology.

State two (2) reasons in support of water as a source of energy.

Account and explain the different states in which water exist.

What is a water shed?

**QUESTION 2** a. Explain the term stream flow

b. State any two (2) environmental approaches to controlling water pollution.

c. Mention any three types of precipitation and explain the mode of formation of any one.

**QUESTION 3** a. Explain the factors affecting the rate of precipitation interception.

b. List the sources of soil moisture recharge.

c. Distinguish between soil moisture classes of capillary and hygroscopic water.

**QUESTION 4** a. Explain the term flooding.

b. State the causes of flooding.

c. Mention the effects of flooding.

**QUESTION 5** Explain the influence of the following on the rate of rain water infiltration into the ground:

a. Vegetation covers

b. Soil surface condition

c. Rainfall intensity.