



"Investing in Africa's future"

COLLEGE OF HEALTH AGRICULTURE AND NATURAL SCIENCES

COURSE CODE: NESN 1201 HYDROLOGY

END OF SECOND SEMESTER EXAMINATION

APRIL 2026

LECTURER: MS G. C. KUHTURU

DURATION: 3 HRS

INSTRUCTIONS

Answer all questions in Section A and any **three** from Section B

Section A carries **40 marks** and each question in section B carries **20 marks**.

SECTION A: Answer **all** questions from this section.

Question 1

- a) Using a diagram, describe the hydrological cycle. **[10 Marks]**
 - b) Discuss the water balance and its importance **[8 Marks]**
 - c) Describe the three conditions that are necessary for precipitation to occur. **[9 Marks]**
 - d) Describe the main sources of errors associated with measuring rainfall using a rain gauge. **[6 Marks]**
 - e) Discuss the practical applications of hydrology. **[7 Marks]**
- [40 Marks]**

SECTION B: Answer any **three (3)** questions from this section

Question 2

Assuming you are the hydrologist in a catchment area with varying land use (e.g., forest, agricultural, industry, and urban settlement);

- a) Describe any two (2) factors that would influence runoff in each land use type. **[8 Marks]**
- b) Write short notes on the Thiessen Polygon Method. **[6 Marks]**
- c) Describe the key qualities of the best drinking water. **[6 Marks]**

Question 3

- a) Draw a single-peaked hydrograph and indicate its various components.

[10 Marks]

- b) Discuss the factors that affect the shape of a storm hydrograph.

[10 Marks]

Question 4

a) Write short note on the words below, describing the factors affecting them:

i. Evaporation. [2 Marks]

ii. Transpiration. [2 Marks]

iii. Evapotranspiration. [2 Marks]

iv. Infiltration. [2 Marks]

v. Runoff. [2 Marks]

b) Describe the two types of overland flow, highlighting the factors that affect them. [10 Marks]

Question 5

a. Use the following rainfall data to find two types of average rainfall over the watershed:

(a) the arithmetic average and

(b) the weighted average using the Thiessen polygon method.

A watershed of 544 ac with six rainfall gauges can be divided into Thiessen polygons with the data listed below. Find the average rainfall over the watershed.

Guage	Rainfall (m)	Area (ac)
A	2.20	101
B	3.32	83
C	0.71	21
D	1.88	111
E	2.49	191

F	6.72	37
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[15 Marks]

b. Describe three types of aquifers.

[5 Marks]

Question 6

a) Discuss, using relevant examples, the anthropogenic impacts on the hydrological cycle.

[15 Marks]

b) What are the precautions that one needs to take when sitting a rain gauge.

[5 Marks]

END OF QUESTION PAPER!!!