



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

CIVIL ENGINEERING

SUBJECT: Water and Sanitation Engineering PAPER NO: 578/15/S07

DURATION: 3 Hours

MARCH/APRIL 2022 EXAMINATION

REQUIREMENTS

INSTRUCTIONS TO CANDIDATE

Answer any five (5) questions.

This paper consists of 2 printed pages.

QUESTION 1

- a) Illustrate and explore processes of the hydrologic cycle. (15 marks)
- b) Explain the measurement of any two (2) of the processes. (5 marks)

QUESTION 2

Elaborate how the following factors influence the hydrology of an area:

- a) Climate factors
- b) Topography
- c) Geology (20 marks)

QUESTION 3

- a) Discuss the following methods used for river discharge measurement
- i) Dilution method (3 marks)
 - ii) Weirs and flumes (4 marks)
 - iii) Current meter (3 marks)
- b) Outline the basic concept of flood routing. (5 marks)
- c) Explain the use of flow rating curves. (5 marks)

QUESTION 4

- a) Explore the physical characteristics of water. (10 marks)
- b) Elaborate the chemical properties of water. (10 marks)

QUESTION 5

Enumerate the four (4) main water borne diseases and explain their occurrence and effects. (20 marks)

QUESTION 6

Give a detailed outline of the water treatment process. (Include a sketch in your answer). (20 marks)

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