

UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEORAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

MAIN EXAMINATION: DECEMBER, 2014

B.Sc. IV

TITLE OF PAPER : **WATER RESOURCES PLANNING**

COURSE NUMBER : **GEP 421**

TIME ALLOWED : **THREE (3) HOURS**

INSTRUCTIONS : **QUESTION 1 IN SECTION A IS COMPULSORY**
ANSWER 2 QUESTIONS FROM SECTION B
ILLUSTRATE YOUR ANSWERS WITH
APPROPRIATE DIAGRAMS

MARKS ALLOCATED : **QUESTION 1 CARRIES 40 MARKS.**
OTHER QUESTIONS CARRY 30 MARKS EACH

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED
BY THE INVIGILATOR

SECTION A: COMPULSORY QUESTION**QUESTION 1**

- a) Distinguish between salvage value and sunk cost. (10 marks)
- b) Two technically feasible alternatives for pumping water to a community are being considered and their cost estimates are given in Table 1 below. Determine the most economical alternative using the present worth method if money is compounded at an interest rate of 10% annually. (30 marks)
- (40 Marks)**

Table1. Cost estimates for the two alternatives.

items	Solar pump	Diesel engine pump
Initial cost	E20,000.00	E25,000.00
Annual O&M	E1000.00	E2000.00
Estimated life	15 years	10 years

SECTION B: ANSWER ANY TWO QUESTIONS**QUESTION 2**

- a) Explain the factors that influence water use in urban areas. (15 marks)
- b) The current population of a hypothetical municipality is 25600 people. The water consumption is estimated to be 200 liters per capita per day. Estimate the water demand for this municipality in the year 2043 if the population growth rate is 2.5% per annum. (15 marks)
- (30 Marks)**

QUESTION 3

Distinguish between prior appropriation and riparianism in the context of water law.

(30 Marks)

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QUESTION 4

- a) Explain the causes of floods. (10 marks)
 - b) Discuss the approaches to flood mitigation. (20 marks)
- (30 Marks)**

QUESTION 5

- (a) Give three definitions of a drought. (10 marks)
 - (b) Discuss the approaches used in drought management. (20 marks)
- (30 Marks)**