UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

DEGREE IN ENVIRONMENTAL HEALTH

MAIN EXAMINATION PAPER 2021

TITLE OF PAPER   : WATER RESOURSES MANAGEMENT II

COURSE CODE   :   EHS419

DURATION   :   2 HOURS

MARKS   :   100

INSTRUCTIONS   :   READ THE QUESTIONS & INSTRUCTIONS
                          CAREFULLY

                     :   ANSWER ANY FOUR QUESTIONS

                     :   EACH QUESTION CARRIES 25 MARKS

                     :   WRITE NEATLY & CLEARLY

                     :   NO PAPER SHOULD BE BROUGHT INTO
                          NOR OUT OF THE EXAMINATION ROOM

                     :   BEGIN EACH QUESTION ON A SEPARATE
                          SHEET OF PAPER

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED
BY THE INVIGILATOR

Question one

a. Define <u>water conservation</u> in water resources management?

[5 marks]

b. A municipality in its report on water bills shows three million Emalangeni losses. Describe five factors that might have contributed to this deficit.

[10 marks]

c. You are employed by a municipality to manage a water treatment plant and you have a problem of high water demand. Explain five measures you will take to effect water demand management. [10 marks]

Question two

a. Describe how you would go about finding a compromise between full cost recovery and equity criteria in your water resources allocation system.

[10 marks]

b. Compare and contrast the concept of free water versus the charge for service philosophy. [15 marks)

Question three

a. Describe how you would implement the concept/principle of polluter pay with regard to water resources management. [15 Marks]

b. The economic costs of a water resources exercise include internalizing the external cost. Explain and give examples of these external costs.

[10 Marks]

Question four

The Faculty of Health Sciences, Mbabane Campus has a population of 120 000 people and each person is allocated 610 lpcd. Calculate:

a) (t)   (1 Marks)

b) (P*)   (2 Marks)

c) V_{total} (3Marks)

d) Average Daily Water Demand   (3 Marks)

e) Maximum Day demand (P)   (3 Marks)

f) Peak hourly Demand   (3 Marks)

g) The Fire Flow demand   (5 Marks)

h) What is the conclusion from this calculation?   (5 Marks)

Question five

Complete the tables below in calculating evapotranspiration and yield loss to crop that suffered water stress for a period of ten days.   [25 marks]

a.

Day (t)	1	2	3	4	5	6	7	8	9	10	sum
Peff(t)											
AM(t)											
RAM(t)											
NRAM(t)											
ETA (t)											