

**UNIVERSITY OF SWAZILAND**  
**Faculty of Health Sciences**

**DEGREE IN ENVIRONMENTAL HEALTH**

**RE-SIT. EXAMINATION PAPER [January 2019]**

**TITLE OF PAPER : WATER RESOURCES MANAGEMENT II**

**COURSE CODE : EHS 419**

**DURATION : 2 HOURS**

**MARKS : 100**

**INSTRUCTIONS :**

- READ THE QUESTIONS & INSTRUCTIONS CAREFULLY**
- ANSWER ALL 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 water conservation 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**

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)											