



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science

DEGREE IN WATER RESOURCES AND ENVIRONMENTAL
HEALTH MANAGEMENT

FINAL EXAMINATION PAPER 2015

TITLE OF PAPER : WATER RESOURCES MANAGEMENT II

COURSE CODE : EHM 419

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 OR 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. Explain five reasons why it is important to determine population projection in water resources management. **[10 Marks]**
- b. Give five examples that demonstrate disadvantages of long term population forecasts **[10 Marks]**
- c. If at average a woman give birth to two children what is the fertility rate? **[5 Marks]**

QUESTION TWO

- a. Explain the four guiding principles adopted in Dublin Rio conference (1992) to prevent or reverse trends of overconsumption, pollution and rising threats from droughts and floods. **[8 Marks]**
- b. Explain five reasons why water cannot be provided for free yet water is known to be a basic human right? **[10 Marks]**
- c. Mention one major precaution that ought to be taken into consideration when pricing water services **[2 Marks]**
- d. Fully describe two elements of water pricing that can be used in equity water allocation. **[5 marks]**

QUESTION THREE

- a. Mention the water use activity with highest percentage of water resources consumption worldwide and estimate its percentage consumption. **[2 Marks]**
- b. Explain five reasons why should an Environmental Health Officer and Water Manager have a basic knowledge of basic components making up agricultural water requirements? **[10 Marks]**
- c. Describe five guiding principles to decide on water allocation dispute in a nutshell? **[13 Marks]**

QUESTION FOUR

Consider a ten (10) day period of a maize crop, at a beginning of which the irrigation system breaks down so that no irrigation water is available over the entire period of 10 days. At day one the soil moisture is at field capacity. The following data are also given.

Potential evaporation E_{tm}	10 mm /d
Effective rainfall P_{eff}	0 mm /d
Rooting depth D	0.8m
Available soil moisture S_a	100 mm /m
Soil moisture depletion fraction p	0.55

Yield response facture 1.25

- a. Calculate, for the 10 days period, the day-today available moisture, and actual evapotranspiration. [6 Marks]
- b. Calculate the reduction due to the breakdown of the irrigation system. [6 marks]
- c. Calculate the actual evapotranspiration if there is 25mm of effective rainfall on each of the 6th and 7th day. [6 marks]
- d. Calculate the reduction in yield for (c) [7 marks]

QUESTION FIVE

- a. Explain in details [using five points] what makes water an important resource above all natural resources in Swaziland. [Marks 20]
- b. What is 'water demand' in relation to water resources management? [5 Marks]