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

DEGREE IN WATER RESOURCES AND ENVIRONMENTAL HEALTH MANAGEMENT

MAIN EXAMINATION PAPER DECEMBER 2018

TITLE OF PAPER	:	WATER RESOURCES MANAGEMENT II
COURSE CODE	:	EHS 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. You are employed by a municipality to manage a water treatment plant discuss five reasons for the calculation of population projection. **[10 Marks]**

b. In water resources management describe five 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 reverse trends of overconsumption, pollution and rising threats from droughts and floods. **[20 Marks]**

b. Mention five reasons why water cannot be provided for free yet water is known to be a basic human right, God given and naturally occurring? **[5 Marks]**

QUESTION THREE

a. Fully describe two elements of water pricing that can be used in equity water allocation. **[5 marks]**

b. Explain five reasons why should an Environmental Health Officer have a basic knowledge of agricultural water requirements? **[20 Marks]**

QUESTION FOUR

Consider a ten (10) days period of a maize crop with no irrigation. At day one the soil moisture is at field capacity. The following data is given to you.

Potential evaporation Et_m	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 6^{th} and 7^{th} day. **[6 marks]**

d. Calculate the reduction in yield for (c) **[7 marks]**

QUESTION FIVE

a. Detail five attributes that makes water an important resource above all other natural resources in Swaziland. **[Marks 20]**

b. What is water resources management? **[5 Marks]**