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

DEGREE IN WATER RESOURCES AND ENVIRONMENTAL
MANAGEMENT

SUPPLEMENTARY EXAMINATION PAPER 2016

TITLE OF PAPER   : WATER RESOURCES MANAGEMENT II

COURSE CODE   :   EHM 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 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

In a certain country, the President proudly presented the latest population statistics: the total population $P = 50$ million people, the fertility rate $f = 2$ average death rate of $d = 1$, and the population growth rate of 3%.

1. What is the average life expectancy? (6)
2. What percentage of people dies each year? (6)
3. How many children are there per woman? (6)
4. How long will it take the population to double? (7)

QUESTION TWO

a. What are the five important reasons that a water resources manager should have knowledge of agriculture water demand? (10)

b. What do you understand by the following terms as they relate to water use by plants in agriculture irrigation?
   i. Evapotranspiration
   ii. Wilting point of a crop (Wp)
   iii. The available soil moisture to plant
   iv. The readily available moisture to plant
   v. Effective rainfall (10)

c. You are asked to decide on a dispute of water allocation, what will be your first line of intervention to consider in solving the problem? (5)

QUESTION THREE

1. A family has not more than E100.00 per month to spend on water bills. At present the family pays E70.00.
   a. Do you expect their reaction to a price increase of 10% to be elastic or rigid? Give reason(s) for your answer. (6)
   b. A few years later after a number of price increases, the amount of money the family is paying amount to E100.00 per month. If the price is again increased by 10% how do you expect their reaction with regards to water demand to be? Explain your answer. (6)

2. Given the following parameters.
   (a) ETo = 6.5 mm/d
   (b) Fc = 20
   (c) Wp = 10
   (d) D root = 80 mm
   (e) Kc = 8.2 mm/d

(f) P = 0.65

Calculate the following

        a. Maximum evapotranspiration (ETm) of a crop.   (4)

        b. Readily available moisture in the root zone   (5)

        c. Readily available moisture to a plant roots   (4)

QUESTION FOUR

Write about water pricing as an important element and key instrument for the implementation of demand management in water resources. In your writing fully describe four elements of water pricing that can be used in equity water allocation.

(25)