**TECHNICAL UNIVERSITY OF MOMBASA**

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING & CIVIL ENGINEERING
**UNIVERSITY EXAMINATION FOR:**
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

**ECE 2405: IRRIGATION ENGINEERING 1**
SPECIAL/SUPPLEMENTARY EXAMINATION
**SERIES:** SEPTEMBER 2018
**TIME:** 2  HOURS

**Instructions to Candidates**
You should have the following for this examination
  *-Answer Booklet, examination pass and student ID*
This paper consists of five questions.
Attempt question ONE (Compulsory) and any other TWO questions.
**Do not write on the question paper.**

**QUESTION ONE (COMPULSORY) 30 Marks**
   a)  Define the phenomenon called "Retrogression"  (4 marks)
   b)  How is the design flood estimated?   (4marks)
   c)  Define the following
         I.    Seasonal consumptive use (4 marks)
   d)  Intensity of irrigation (4 marks)
   e)  Uncullinable command area and give examples
   f)  Find out the capacity of a reservoir from the following data. The C.C.A is 80,000ha

| Crop | Base period in days | Area in Ha | Intensity of irrigation  in % |
|---|---|---|---|
| **Rice** | 120 | 1800 | 25 |
| **Wheat** | 120 | 2000 | 30 |
| **Sugarcane** | 120 | 2500 | 20 |

Assume that canal and reservoir losses are 5% and 10% respectively.

**ANSWER ANY TWO QUESTIONS FROM THIS SECTION**
**QUESTION TWO (20 Marks)**

a) Why is assessment of water needed in irrigation  (5 Marks)
b) On assessment of water needed in irrigation the rates for different crops have been fixed on what basis?   (7 marks)
c) Outline methods of application or distribution of water   (8 Marks)


**QUESTION THREE (20 Marks)**

**a)** Define the following terms
  II.    Water application
  III.   Water Conveyance
  IV.   Consumptive use Efficiency    (6 marks)
**b)** Outline the 3 typesof consumptive use.  (5 marks)


**QUESTION FOUR (20 Marks)**
a) Outline the 3 types of consumptive use (5marks)
b) Enumerate the steps to be followed for proper site for drainage crossing (5 marks)


**QUESTION FIVE (20 Marks)**

a) Define Head work (4marks)
b) Headwork is divided into two classes describe them  (8 marks)
c) Describe the comparison between barrage and heir  (8 marks)