



## **SOUTH EASTERN KENYA UNIVERSITY**

### **UNIVERSITY EXAMINATIONS 2017/2018**

#### **FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HYDROLOGY AND WATER RESOURCES MANAGEMENT**

##### **WRM 202: WATER AND IRRIGATION**

**DATE: 4<sup>th</sup> DECEMBER, 2017**

**TIME: 1.30-3.30 P.M**

#### ***Instructions:***

- a) Answer **all** the questions in section A (30 marks).
- b) Answer any **two (2)** questions in Section B (40 marks).
- c) Maximum marks for each question are as shown.
- d) Illustrate your answers with carefully drawn sketches and diagrams where appropriate;
- e) Time allowed: 2 hours.

#### **Section A (30 Marks)**

1. Provide the meaning of the following terms as used in ground water recharge
  - i) Irrigation efficiency (ii) Permanent wilting point (iii) Agricultural drainage
  - (iv) Infiltration rate (v) Soil profile (5marks)
2. a) State three (3) types of irrigation methods (3marks)  
b) List two (2) factors that influence rate of infiltration (2marks)
3. a) List three (3) types of surface irrigation methods (3marks)  
b) State two (2) factors to consider when using drip irrigation (2marks)

4. a) List five (5) environmental factors that influence frequency and volume of irrigation water (5 marks)
5. a) List three (3) fundamental ways of measuring crop water use (3marks)  
b) A 0-70cm soil test is returned with a gravimetric water content of 25%. The soil is a self-mulching grey clay with a bulk density of  $1.4\text{g/cm}^3$ . Crop lower limit is 23%. How much water will be available to the wheat crop? (2 marks)
6. State five (5) advantages of using sprinkler irrigation method (5 marks)

**Section B (40 marks)**

7. a) Elaborate on five (5) benefits of irrigation in Kenya (10 marks)  
b) Discuss five (5) benefits of carrying out water quality assessment in an irrigation scheme? (10marks)
8. a) List five (5) conditions necessary for sustainability of Water Users' Associations in irrigation schemes (10 marks)  
b) Discuss two (2) types of drainage in irrigation systems (10marks)
9. a) Discuss five (5) methods of improving irrigation efficiency in irrigation schemes Kenya (10 marks)  
b) Discuss five (5) best management practices (BMPs) used in irrigation management (10marks)