

**MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS**

 **2016/2017 ACADEMIC YEAR**

**THIRD YEAR FIRST SEMESTER**

**SCHOOL OF TOURISM AND NATURAL RESOURCE MANAGEMENT**

**BACHELOR IN ENVIRONMENTAL STUDIES**

**(ENVIRONMENTAL BIOLOGY AND HEALTH)**

**COURSE CODE: EBH 302**

**COURSE TITLE: WATER, SANITATION AND HYGIENE**

**DATE: 27TH JANUARY, 2017 TIME: 1100 – 1300HRS**

**INSTRUCTIONS TO CANDIDATES**

Answer **ALL** questions in section **A** and any other **THREE** in section **B.**

***This paper consists of 2 printed pages. Please turn over***

**SECTION A**

1. What is the difference between hygiene and sanitation **(2marks)**
2. What are some benefits a community can obtain from instilling sanitation? **(5marks)**
3. Under Integrated Water Resource Management Tool, What does the 1992 Dublin Principal State? **(4marks)**
4. What does the colour of water indicate? **(3marks)**
5. What is a supply system? **(1mark)**
6. Define the following terms as used in water distribution. **(5marks)**
7. Average day demand -.
8. Maximum day demand –
9. Peak Hour Demand –
10. Peaking Factors –
11. Transmission pipeline -
12. Name 5 methods used for water purification **(5marks)**

**SECTION B**

1. Explain which 4 actions can a community undertake to improve water quality giving the type of pollution **(8marks)**

b) Name 3 main types of sanitation **(3marks)**

c) Give 4 benefits of using integrated water resource management (IWRM) tool **(4marks)**

1. A) The Maasai Mara University has 4000 student capacity with an average daily water demand of 40L/capita/day. **(10marks)**

Given; Max daily demand factor is 1.8

Max hourly demand factor is 3.25

Qf= 1020(P)1/2(1-0.01(P)1/2)

Where Q is the fire demand flow in m3/min

P is population in 1000s

* 1. Calculate the average daily water demand for the school **(1mark)**
	2. Calculate the maximum daily demand **(1 mark)**
	3. Calculate the fire demand for the school in the month of March for 10hours duration daily rate **(4marks)**
	4. What is the distribution system flow rate on the Maximum day      **(1mark)**
	5. What capacity should the storage reservoir have on a day with a Max hour demand and a Max daily demand? **(3marks)**
1. B) What primary standard criteria are used in setting drinking water quality standards? **(5marks)**
2. a) ECOSAN is an Integrated (multisectoral) approach to water management. Explain how any two of the following sectors can benefit through ECOSAN.                                **(10marks)**
	1. Health
	2. Climate protection
	3. Energy
	4. Economics and labour promotion

 b) Which types of filters are favourable for the below purposes **(5marks)**

       Eliminating the following contaminants:

1. Biological Entities, Heavy Metals, Organic Chemicals, Inorganic Chemicals & Radioactive Material **(1mark)**
2. Chlorine, pesticides, herbicides and inorganic materials **(1mark)**
3. Toxin removal **(1mark)**
4. Serving large communities **(1mark)**
5. Serving Small communities **(1mark)**
6. a) Name and explain the four categories of water related diseases     **(8marks)**

b) Explain the role of sanitation in the F diagram **(6marks)**

c) Who is in charge of monitoring water quality and services by Water Supply Points in Kenya**? (1mark)**

**//END**