

**MAASAI MARA UNVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS**

**2016/2017 ACADEMIC YEAR**

**THIRD YEAR FIRST SEMESTER**

**SCHOOL OF TOURISM & NATURAL RESOURCES MANAGEMENT**

**BACHEOR OF SCIENCE IN FORESTRY**

**COURSE CODE: FOR 312**

**COURSE TITLE: FOREST HYDROLOGY**

**DATE: 23rd JANUARY, 2017 TIME: 08:30-10:30 AM**

**INSTRUCTIONS TO CANDIDATES**

Answer **ALL** questions in Section A, and any **THREE** questions in Section B

Use illustrations where appropriate. A simple calculator required during this examination. Borrowing of any materials from other candidates is strictly not allowed.

This paper consists of 3 printed pages. Please turn over

**SECTION A (COMPULSORY)**

**Question One**

(a)Describe the operation of a standard rain gauge. **(2 marks)**

(b)Explain the meaning of each of these terms or phrases that are usually encountered in hydrology.

1. Aquifer (**2 marks)**
2. Wetlands **(2 marks)**
3. Interflow **(2 marks)**
4. Evapotranspiration **(2 marks)**
5. Physical water quality indicators **(2 marks)**

 (c)The following field observations were recorded at gauging site on a stream. Study this table and answer the questions that follow.

|  |  |  |
| --- | --- | --- |
| **Depth** | **Current meter readings****(revolutions)** | **Duration****(seconds)** |
| 0.2d | 34 | 51 |
| 0.8d | 26 | 54 |

If the coefficients of the current meter were a=0.37 and b=0.004 obtain an estimate for the velocity of flow at the site**. [6 marks]**

(d)Explain why many people believe that the Kenyan water towers must be protected at all costs. **[7 marks]**

**[Total 25 marks]**

**SECTION B (ANSWER ONLY THREE QUESTIONS)**

Q2 “To inculcate progressive attitudes towards the use and conservation of water, we need to engage younger generation”. (Mwai Kibaki, UNESCO Special envoy for water in Africa, Daily Nation, 6th April, 2016). Discuss five strategies on how this could be achieved. **[15 marks]**

Q3 (a)Describe two uses of point rainfall observations in forested areas? **[4 marks]**

(b)Using suitable sketches explain how one could use the arithmetic mean method to and meteorological observations to obtain an estimate of the areal evaporation over a lake. **[11 marks]**

Q4 A forestry student wishes to do a preliminary survey the general quality of water in all the boreholes that have been drilled in a river basin. Describe how this investigation could be done. **[15 marks]**

Q5 (a)Using a sketch describe the main characteristics of a stream hydrograph  **[4 marks]**

(b) Explain how human activities in the watershed could influence the shape and peak of such a hydrograph. **[11 marks]**

Q6 Discuss four hazards involved in household water harvesting systems and clearly how the risks involved in each could be minimized. **[15 marks]**

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