



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER**

**SCHOOL OF TOURISM & NATURAL
RESOURCES MANAGEMENT
BACHEOR OF ARTS IN GEOGRAPHY**

COURSE CODE: GEO 2218

**COURSE TITLE: HYDROLOGY AND WATERSHED
RESOURCES**

DATE: 15TH APRIL 2019

TIME: 8.30AM -10.30AM

INSTRUCTIONS TO CANDIDATES

Answer question **ONE** and any other **TWO** questions. Two graph papers have been provided. Simple calculators are allowed in this examination.

Use illustrations where appropriate

This paper consists of 2 printed pages. Please turn over

SECTION A (ANSWER ALL QUESTIONS)

Q1

- a) Explain how estimates of the following processes of hydrological cycle are obtained in the field.
 - i. Soil moisture **(2 marks)**
 - ii. Evapotranspiration **(2 marks)**
 - iii. Precipitation **(2 marks)**
- b) Describe the main role of the Water Resources Authority in Kenya **(2 marks)**
- c) Using a sketch of a hypothetical watershed, demonstrate how stream orders are allocated and how a river basin could have a stream order of 5. **(4 marks)**
- d) Explain the usefulness of obtaining the following basin characteristics;
 - i. Concentration time **(2 marks)**
 - ii. Size of basin **(2 marks)**
 - iii. Average stream slope **(2 marks)**
 - iv. Areal precipitation **(2 marks)**
- e) The table below gives a summary of data obtained under a bridge in a river basin of Area 950 sq. km. Study the data and answer the questions that follow;

| | |
|-----------------|---------------------------------------------------------------------------------|
| Time (Hrs) | 0, 2, 3, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 26, 27 |
| Runoff (Cumecs) | 50, 50, 50, 50, 200, 1600, 3700, 2600, 1400, 900, 500, 200, 150, 75, 50, 50, 50 |

- i. Using the graph paper provided plot the Total Runoff Hydrograph **(4 marks)**
- ii. Explain the significance of ONE special characteristic of this graph **(2 marks)**
- iii. Estimate the effective rainfall amount **(4 marks)**

[Total 30 marks]

SECTION B (ANSWER ONLY TWO QUESTIONS)

- Q2 Discuss human impacts on the hydrological cycle. **[20 marks]**
- Q3 (a) Describe what happens at a gauging station. **(4 marks)**
(b) Explain how a geography student could obtain the average annual volume of streamflow at one point along the channel of a small stream. **(16 marks)**
- Q4 Describe ten suitable measures that you would recommend for the control of soil erosion in farming areas that have steep slopes. **[20 marks]**
- Q5 A group of students wishes to study the water quality at the intake point of a water treatment plant in a catchment. This treatment plant supplied water to a nearby urban centre. Describe five water quality variables that they should consider and give a justification for each. **[20 marks]**

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