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# **UNIVERSITY OF KABIANGA**

**UNIVERSITY EXAMINATIONS**

**2015/2016 ACADEMIC YEAR**

**THIRD YEAR FIRST SEMESTER EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRO-FORESTRY AND RURAL DEVELOPMENT**

**COURSE CODE: FOR 312**

**COURSE TITLE: FORESTRY HYDROLOGY**

***DATE: 7TH DECEMBER, 2015* *TIME: 9 A.M- 12 P.M***

**INSTRUCTIONS:**

***ANSWER ALL QUESTIONS IN SECTION A AND ANY OTHER TWO QUESTIONS IN SECTION B.***

**SECTION A (Compulsory)**

1. Define the following terms as used in forest hydrology.
2. Watershed. (1 mark)
3. Through fall. (1 mark)
4. Surface runoff. (1 mark)
5. Interception. (1 mark)
6. Forest influences. (1 mark)
7. Hydrological cycle. (1 mark)
8. Explain the principle of the mechanism of the tipping-bucket rain gauge. What are the advantages of this type of instrument compared to the non-recording rain gauge? (6 marks)
9. Briefly explain why a watershed is considered as a planning or a management unit in integrated natural resource management. (6 marks)
10. With a well labelled diagram, explain the hydrological cycle indicting its major processes. (6 marks)
11. Explain with the help of a well labelled diagram, the method of stream gauging by the velocity-area method. (6 marks)

**SECTION B (Answer any two questions)**

1. Explain how forests influence the disposal of rainfall in a watershed and the impact of this on the rainfall-runoff relationship and water quality. (20 marks)
2. Point rainfall due to a storm at several rain gauge stations in a watershed are shown in the table below. Determine the mean rainfall over the watershed by:
3. Arithmetic Mean Method. (4 marks)
4. Thiessen Polygon Method. (16 marks)

|  |  |  |
| --- | --- | --- |
| **Station** | **Area of influential polygon (A)** | **Rainfall recorded, Pi (cm)** |
| A | 170 | 9.3 |
| B | 164 | 10.5 |
| c | 156 | 10.9 |
| D | 150 | 12.2 |
| E | 116 | 13.5 |
| F | 36 | 14.0 |
| G | 24 | 14.2 |
| H | 42 | 12.8 |

1. Discuss the observed and anticipated impacts of one of the following factors of availability and access to water resources and forests. (20 marks)
2. Climate change
3. Population growth
4. Urbanization
5. Land use change