UNIVERSITY OF EMBU

2016/2017 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

SECOND YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN WATER RESOURCES MANAGEMENT/ BACHELOR OF SCIENCE IN MANAGEMENT OF AGROECOSYSTEMS AND ENVIRONMENT

AEM 201 – ENVIRONMENTAL HYDROLOGY

DATE: APRIL 12, 2017   **TIME: 8:30-10:30AM**

INSTRUCTIONS:

Answer Question ONE and ANY other TWO Questions

QUESTION ONE

a) Describe the three levels used to categorize atmospheric circulation.   (3 Marks)

b) Distinguish between <u>suspended load</u> and <u>wash load</u> as used in sedimentation studies.

(6 Marks)

c) Explain the terms environment and hydrology.   (2 Marks)

d) Describe three types of sampling procedures used in streamflow sediment measurement.

(6 Marks)

e) Explain the five basic grouped divisions of physiographic and climatic descriptors of catchments.   (5 Marks)

f) State the objectives of sediment measurement in environmental hydrology.   (4 Marks)

g) Explain the term 'pollutant' as used in environmental hydrology.   (4 Marks)

QUESTION TWO

a) Evaluate the catchment characteristics that can be used to describe drainage basins in Embu County. (10 Marks)

b) Evaluate the application of 'stabilization and solidification' as a remediation technology in environmental management. (10 Marks)

QUESTION THREE

a) Analyze the assumptions appliedd in the use of 'unit hydrograph theory' in environmental hydrology studies. (8 Marks)

b) Describe the steps used to derive a hydrograph for River Tana Basin. (12 Marks)

QUESTION FOUR

a) Explain the concept of the triple cell as used in environmental hydrology. (12 Marks)

b) Describe 'air mass' as a transitory system in studying environmental hydrology. (8 Marks)

QUESTION FIVE

a) Explain the basis and process of using satellites in the measurement of global precipitation. (11 Marks)

b) A drainage basin has an area of 210 km^2. The average depth of rainfall received by it during a monsoon period is computed as 65 cm, while the runoff measured at its outlet during the same period is estimated to be 5.68 x 10^7 m^3.

   i. Compute the depth of runoff and the percentage of rainfall that has become runoff. (6 Marks)

   ii. If all this runoff volume is stored and used to irrigate a crop which requires 60 cm of water, how many hectares can be irrigated? (3 Marks)

END