



SOUTH EASTERN KENYA UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN METEOROLOGY

SMR 409: HYDROMETEOROLOGY II

DATE: 05TH DECEMBER, 2017

TIME: 10.30 -12.30 PM

INSTRUCTIONS TO CANDIDATES

Answer QUESTION ONE and ANY two from QUESTIONS TWO to QUESTION FIVE

QUESTION ONE

(30 Marks)

- a) Highlight some of the differences between a random event and an observation of an experiment (5 Marks)
- b) Outline the differences between lumped and distributed catchment models (5 Marks)
- c) Describe the strengths and weaknesses if any of National Hydrological Service (5 Marks)
- d) Explain what is meant by “distribution fitting as used in statistical hydrology (5 Marks)
- e) Write down and explain the terms that define the Autoregressive moving average process (5 Marks)
- f) Explain any two tests of homogeneity in a time series (5 Marks)

QUESTION TWO

(20 Marks)

- a) Discuss any TWO components of a time series (8 Marks)
- b) Write short notes on the following stochastic models
 - i. Autoregressive models (5 Marks)
 - ii. Autoregressive integrated moving average models (7 Marks)

QUESTION THREE

(20 Marks)

- a) Explain the meaning of “Monte Carlo simulation” highlighting its advantages (10 Marks)
- b) Describe the methods of “Maximum Likelihood Estimation” and that of “Moments” (10 Marks)

QUESTION FOUR

(20 Marks)

Explain the characteristics of the following models:

- i. Conceptual models (10 Marks)
- ii. Physics based models (10 Marks)

QUESTION FIVE

(20 Marks)

- a) Discuss different types of flooding (10 Marks)
- b) Describe any FOUR long-term programs that are useful in Kenya for combating drought when it occurs (10 Marks)