



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY SCHOOL
OF INFORMATICS AND INNOVATION SYSTEMS
UNIVERSITY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE
ACTUARIAL
2ND YEAR 1ST SEMESTER 2013/2014 ACADEMIC YEAR
REGULAR**

COURSE CODE: SAS 205

COURSE TITLE: STAISTICAL COMPUTING

EXAM VENUE: LR 3

STREAM: (BEd Arts and Science and actuarial science)

DATE: 24/04/14

EXAM SESSION: 2.00 – 4.00 PM

TIME: 2.00 HOURS

Instructions:

- 1. Answer question 1 (Compulsory) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE 30 MARKS (COMPULSORY)

- a) i) Computer problem- solving process is made up of three phases. Identify these phases and the constructs of each phase. Explain each construct. [9 Marks]
ii) By use of a well labeled diagram, show the interactions between the above three phases. [4 Marks]
- b) Describe the four important properties of an Algorithm [6 Marks]
- c) Describe the five basic steps in a statistical study, and give an example of their application. [5 Marks]
- d) Explain in details any four areas in which statistical computing can be used [6 Marks]

QUESTION TWO 20 MARKS

- a) Each month, the Kenyan Labor Department surveys 60,000 households to determine characteristics of the Kenya work force. One population parameter of interest is the Kenya unemployment rate, defined as the percentage of people who are unemployed among all those who are either employed or actively seeking employment. Describe how the five basic steps of a statistical study apply to this research. [10 Marks]
- b) Explain the following phases of a compiler [6 Marks]
- i. Lexical analysis
 - ii. Syntax analysis
 - iii. Semantic analysis
- c) Distinguish between qualitative data and quantitative data; give two examples of each. [4 Marks]

QUESTION THREE 20 MARKS

- a) Define the terms population, sample, population parameter, and sample statistics as they apply to statistical studies. [4 Marks]
- b) Explain the purpose and importance of Chi Square as a nonparametric statistic. [6 Marks]
- c) What are the three main purposes/function of an operating system? [3 Marks]
- d) Explain null and alternative hypothesis [3 Marks]
- e) Explain the characteristics of the operating systems for mainframe computers and personal computers [4 Marks]

QUESTION FOUR 20 MARKS

- a) i) Briefly describe any four of the eight guidelines for evaluating statistical studies. [6 Marks]
ii) Give an example to which each guideline applies. [4 Marks]
iii) What do we mean by variables of interest in a study? [2 Marks]

- b) Define and distinguish among positive correlation, negative correlation, and no correlation. [6 Marks]
- c) How do we determine the strength of a correlation? [2 Marks]

QUESTION FIVE 20 MARKS

- a) For each of the experiments described below, identify any problems and explain how the problems could have been avoided.
- i) A chiropractor wants to know if his adjustments relieve back pain. He performs adjustments on 25 patients with back pain. Afterward, 18 of the patients say they feel better. He concludes that the adjustments are an effective treatment. [3 Marks]
- ii) A new drug for attention deficit disorder (ADD) is supposed to make the affected children more polite. Randomly selected children suffering from ADD are divided into treatment and control groups. Those in the control group receive a placebo that looks just like the real drug. The experiment is single-blind. Experimenters interview the children one-on-one to decide whether they became more polite. [3 Marks]
- b) An election eve poll finds that 52% of surveyed voters plan to vote for Smith, and she needs a majority (more than 50%) to win without a runoff. The margin of error in the poll is 3 percentage points. Will she win? [4 Marks]
- c) Describe what is meant by simulation modeling [2 Marks]
- d) Describe the advantages and disadvantages of using simulation modeling in complex analysis [4marks]
- e) Using a diagram, explain the context of a compiler [4 Marks]