



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

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JANUARY – APRIL 2018 TRIMESTER

FACULTY OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF SOCIAL SCIENCES

REGULAR PROGRAMME

SSO 303: ADVANCED SOCIAL STATISTICS

Date: APRIL 2018

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

Q1. a) Explain the five steps involved in hypothesis testing **(10 marks)**

b) Is gender independent of education level? A random sample of 198 people was surveyed and each person was asked to report the highest education level they obtained. The data that resulted from the survey is summarized in the following table:

	High School	Bachelors
Female	60	54
Male	40	44
total	140	98

Conduct a two variable chi-test to test the hypothesis **(20marks)**

Q2. a) Chebet earned a score of 940 in the KCSE examinations. The mean test-score was 850 with a standard deviation of 100. Assuming that the test was normally distributed, calculate the proportion of students who had a higher score than Chebet. **(10marks)**

b) In statistics examinations, the mean was 72 and SD was 15. Assuming that the scores were normally distributed calculate the standard scores of students with the following scores:

- i) 60 **(5marks)**
ii) 73. **(5marks)**

- Q3. An investigator thinks that people under the age of forty have vocabularies that are different than those of people over sixty years of age. The investigator administers a vocabulary test to a group of 31 younger subjects and to a group of 31 older subjects. Higher scores reflect better performance. The mean score for younger subjects was 14.0 and the standard deviation of younger subject's scores was 5.0. The mean score for older subjects was 20.0 and the standard deviation of older subject's scores was 6.0. Does this experiment provide evidence for the investigator's theory?
- a) Provide, in words, the null and alternative hypotheses. **(4marks)**
 - b) Provide the decision rule for rejecting the null hypothesis, including the critical value(s) for the appropriate statistic. **(6marks)**
 - c) Using an alpha level of .05, test the null hypothesis. As part of this test, please compare the actual value for the appropriate statistic against the critical value(s) for the appropriate statistic. **(5marks)**
 - d) State your conclusion regarding the results from this test in language that a friend of yours with no knowledge of statistics could understand. **(5marks)**
- Q4. Some high school students were divided into two groups, group A and group B, and given the same test. Group A consisted of 6 students and the average score was 12 with a standard deviation of 2. Group B consisted of 8 students and the average score was 11 with a standard deviation of 3. Calculate the variance between the groups. **(20marks)**
- Q5. a) Describe any four properties of a normal curve. **(12Marks)**
- b) Discuss any four Areas of application of the normal distribution. **(8marks)**

END