



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

SEPTEMBER –DECEMBER 2021

FACULTY OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

REGULAR PROGRAMME

ECN 313: ECONOMIC STATISTIC II

Date: DECEMBER 2021

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any TWO Questions

Q1.

- a) With the aid of relevant examples, distinguish between:
- Probability sampling and nonprobability sampling. **(2 Marks)**
 - Basic research and applied research **(2 Marks)**
 - Parametric and non-parametric tests **(2 Marks)**
- b) Jane and John are students of the ECN 313 class at CUEA, and they have heard about the recent uproar by Kenyans about the Competency-Based Curriculum (CBC). Some Kenyans are in support of CBC, and others are opposed to it. Since Jane and John are Statistics students, they intend to carry out a statistical inquiry to find out the actual perception of Kenyans about CBC and its effects on learners and parents.
- Highlight the steps that Jane and John should follow while conducting the statistical inquiry **(7 Marks)**
 - Explain four reasons why Jane and John might opt for a sample survey instead of a census **(4 Marks)**

- iii) Suppose that they agree on conducting a sample survey; explain how the sampling process should proceed **(4 Marks)**
- iv) John and Jane suppose they agree to work with a sample of 2,000 Kenyans and collect data from using mailed questionnaires. Assume 1800 Kenyans responded to their questionnaires. Explain the data analysis steps they should follow from the point they receive the questionnaires from the respondents to the point they come with the results and conclusions from their data **(7 Marks)**
- c) State two uses of index numbers **(2 Marks)**

Q2.

- a) The directorate of quality assurance proposes a study at CUEA to analyze customer satisfaction among students at CUEA. Stratified sampling is to be employed to identify respondents. The findings from the survey will be used to review customer service to all students at CUEA. You have been approached to advise how a sample of 300 students respondents should be selected for this study. Prepare a description of how the sampling process should proceed, clearly explaining an appropriate stratification procedure and the number of students to be considered from each stratum. **(3 Marks)**
- b) State and explain the appropriate sampling design which can be applied in each following situation.
- i) A Journalist covering a story and needs eyewitnesses of the story **(3 Marks)**
- ii) A researcher is trying to figure the best days of the month to carry out an audit or the best day to analyze the stock process. **(3 Marks)**
- iii) A social scientist who intends to get a sample of night runners and witchdoctors **(3 Marks)**
- c) Suppose a researcher applied a linear regression model

$$Y_t = \alpha + \beta X_t + e_t$$

to estimate the relationship between food expenditure (Y) and income (X) using

observations from 100 households in a particular country. The estimated results are as follows

$$\hat{y}_t = 83.42 + 0.1021 X_t$$

$$(Se) \quad (43.41) \quad (0.0209) \quad R^2 = 0.94$$

- i) Construct a 95% interval for β **(3 Marks)**
- ii) Test the hypothesis that $\beta = 0$ **(3 Marks)**
- iii) What would be the estimated food expenditure if income was 1500 **(2 Marks)**

Q3.

- a) List five Qualitative Research Methods **(5 Marks)**
- b) Not all respondents answer every item in the questionnaire. Answers may have been left blank during field data collection.
 - i. Briefly explain reasons why respondents may leave questions blank. **(5 Marks)**
 - ii. Discuss how these blank responses can be handled. **(4 Marks)**
- c) Discuss the limitations of a participant-observer as a method of data collection **(6 Marks)**

Q4.

- a) State 5 causes of systematic bias in sample survey **(5 Marks)**
- b) A researcher used the following empirical model to study the determinants of housing prices in Nairobi:

$$Y = B_0 + B_1 X_1 + B_2 X_2 + B_3 X_3$$

Where,

Y = house prices

β_0 = Autonomous house prices in thousands

β_i = Coefficient of respective independent variables

X_1 = Number of bedrooms

X_2 = size in square feet

X_3 = Annual demand of housing

The findings of the study (the estimated Model) are shown below:

$$Y = 109524 - 163651 X_1 + 283.7 X_2 + 11.74 X_3$$

SE (63420) (24167) (9.67) (2.14)

Adjusted $r^2 = 0.986$

Required:

- i. Using Adjusted r^2 comment on the strength of the model **(2 Marks)**
 - ii. Explain in words the meaning of the numeric value (the coefficients) of X_1 and X_2 . **(3 Marks)**
 - iii. What can be said, if anything, about the terms in the brackets? **(2 Marks)**
 - iv. Highlight various methods that could have been used to estimate the specified model. **(4 Marks)**
- c) Use appropriate illustrations to distinguish between the Stratified sampling and Multistage sampling. **(4 Marks)**

Q5.

a) Miss. Mbugua wishes to determine the stability of the price of a particular stock. She decides to base her judgment regarding the stability on the standard deviation of the stock's daily closing price. Checking the financial pages, Miss. Mbugua learns that the stock has been traded on the exchange for quite some time, and many closing prices are dating back several months rather than using all these prices. Miss. Mbugua decides to simplify her arithmetic and select a random sample of $n = 7$ days. She noticed the closing prices for the seven days were 87, 120, 54, 92, 73, 80, and 63.

- i) What is the range of the share price **(2 Marks)**
- ii) What is the average share price **(3 Marks)**
- iii) What is the variance in the average share price **(3 Marks)**

b) The following are the burning times (rounded to the nearest 10th of a minute) of random samples of two kinds of emergency flares brands

Brand 1	17.2, 18.1, 19.3, 21.1, 14.4, 13.7, 18.8, 15.2, 20.3, 17.5,
Brand 2	13.6, 19.1, 11.8, 14.6, 14.3, 22.5, 12.3, 13.5, 10.9, 14.8,

Use the Mann Whitney U – Test at 0.005 level of significance to test whether it is reasonable to say that on average, brand 1 flares are better(last longer) than bran 2 flares **(12 Marks)**

END