MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR
THIRD YEAR FIRST SEMESTER

SCHOOL OF BUSINESS AND ECONOMICS
BACHELOR OF COMMERCE

COURSE CODE: BCM 3153-1
COURSE TITLE: MANAGERIAL STATSTICS

DATE: 11/12/2023 **TIME: 0830-1030 HRS**

INSTRUCTIONS TO CANDIDATES

1. **Answer Question ONE and any other THREE questions**
2. **Do NOT write on this Question paper**

QUESTION ONE

a) Differentiate between standard deviation and standard error. **(3 marks)**

b) Differentiate point estimation and interval estimator of a population. **(3 marks)**

c) Using diagrams to substantiate your argument, explain the following properties of an estimator
   i) Biasness **(5 marks)**
   ii) Minimal variance **(5 marks)**

d) Using well labeled diagrams to support your answer, differentiate between a two Tailed test and one Tailed test as applied to hypothesis testing explaining how you would identify a two Tailed test from a one Tailed one **(4 marks)**

QUESTION TWO

The students of managerial statistics of school of business and economics carried out a study to determine the relationship between marital status and alcohol consumption amongst residents of a given community in Kenya. The findings were given in the table below.

DRINKS PER MONTH

	Abstain	**1-60**	**Over 60**
Single	67	213	74
Married	411	633	129
Widowed	85	51	7
Divorced	27	60	15

Using chi-square test determine if the data suggest at 5% significance level, that marital status and alcohol consumption patterns are related. **(10 marks)**

QUESTION THREE

Over the past several months an adult patient has been treated for tetany (severe muscle spasms). This condition is associated with an average total calcium level below 6gm/dl. Recently the patient's total calcium test gave the following reading (in mg/dl) 9.3 8.8 10.1 8.9 9.4 9.8 10.0 9.9 11.2 12.1 giving us a mean (x) of 9.95 and standard deviation (s) of 1.02
Determine a 99% confidence interval for the population mean of total calcium in the patient blood. **(10 marks)**

QUESTION FOUR

A lecturer had students in a class rate his performance as excellent, good, fair or poor. The rating were collected with the students being assured that the lecturer would not receive them until after the students course grades reach the exam office.

The rating (i.e. treatment) a student gave the lecturer was matched with his/her course grade which could range from 0 to 100. The sample information is reported as below

COURSE GRADE

Excellent	**Good**	**Fair**	**Poor**
94	70	70	68
90	68	73	70
85	77	76	72
80	83	78	65
	88	80	74
		68	65
		65	

Using 5% significance level determine if there is a difference in the mean score by the students in each of the four rating categories. **(10 marks)**

QUESTION FIVE

Given a population consisting of the following elements 1,2,3,4,5

a) For a sample of three determine the number of possible samples when
   i) Sampling is done with replacement **(2 marks)**
   ii) Sampling is done without replacement **(2 marks)**
b) For a sample of two determine the sampling distribution of the sample means when sampling is done without replacement. **(3 marks)**
c) Determine the sampling distribution of the variance (**3 marks)**

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