JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL SCIENCES
UNIVERSITY ASSESSMENT FOR CBET DIPLOMA IN APPLIED STATISTICS

2nd Year 1st SEMESTER 2023/2024 ACADEMIC YEAR
MAIN REGULAR

COURSE CODE: WAB 2219
COURSE TITLE: Statistical Inference
EXAM VENUE: **STREAM: (Dip. Applied Statistics)**

DATE: **EXAM SESSION: Sep-Dec 2023**

TIME: 3.00 HOURS

Instructions:

1. **Answer ALL questions in section A (compulsory) and any other two questions in section B.**
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.**

SECTION A: (40 MARKS)

QUESTION ONE(40 MARKS)

a) Define the following terms as used in statistical hypothesis testing.
   i. Null hypothesis
   ii. Alternative Hypothesis
   iii. Acceptance Region
   iv. Critical Value(s)
   v. Critical region

b) Explain the following terms as used in theory of estimation.
   i. Estimation
   ii. Point estimation
   iii. Interval estimation
   iv. Parameter
   v. Estimate

c) Test at 95% significance that a sample of size n=25, mean of 79 and standard deviation of 10 was drawn at random from a population with mean =75 and unknown standard deviation.

d) From past experience, it was noted that the weights of bolts is normally distributed with the standard deviation of 200kg. A random sample of 64 beds gave a mean of 6200kg. Find out the population mean at 95% level of confidence.

e) To estimate the proportion of female students at JOOUST, a random sample of 120 students is selected. There are 69 female students in the sample. Estimate the proportion of students at the college who are female at 90% CL. (Critical value of z =±1.645)

f) Fill in the missing entries of the partially completed one-way ANOVA table.

Source	df	SS	MS = SS/df	F-statistic
Treatments	_____	2.124	0.708	0.75
Error	20	_____	____	
Total	_____	_____		

g) Differentiate between the two types of errors in hypothesis testing

h) State the assumption of student t test

SECTION B (60 marks)

QUESTION TWO(20 marks)

a). Briefly explain the assumptions of parametric tests

b). Briefly discuss the properties of a good estimator

QUESTION THREE(20 marks)

Discuss the steps required in hypothesis testing.

QUESTION FOUR(20 marks)

Two independent samples of 8 and 7 items respectively gave the following values;

A: 9 11 13 11 15 9 12 14

B: 10 12 10 14 9 8 10

Test whether the difference between the means of the two samples is significant. (Use table value of 3.73)

QUESTION FIVE(20 marks)

Using the following data, test the hypothesis that *colon cancer is independent of red meat consumption* at 95% level of significance. (use cv of 3.841)

Colon Cancer	Meat Consumption		Total
	YES	NO	
Yes	36	23	59
No	30	39	69
	66	62	128

QUESTION SIX(20 marks)

The table below shows the lifetime under controlled conditions, in hours, of a sample of electric light bulbs in three different brands.

A: 16,15,13,21,15
B: 18,22,20,16,25
C:26,31,24,30,24

Assuming all lifetimes are normally distributed with common variance, test at 1% significance level that there is no difference between the three brands. (use cv of 6.93)