LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

1ST SEMESTER 2023/2024 ACADEMIC YEAR

SECOND YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ECONOMICS & STATISTICS

ECON 212: ECONOMIC STATISTICS II

STREAM: *ECON STAT* ***TIME: 2 HRS***

DAY: MONDAY [11.30-13.30 P.M] ***DATE: 4/12/2023***

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

Instructions

1. Answer question **ONE** and any other **TWO** questions.
2. Question **ONE** is compulsory and carries **30** marks
3. All other questions carry **20** marks each.
4. Ensure your hand writing is neat and legible. Also ensure that your grammar is correct.

QUESTION 1

(a) Distinguish between relative frequency probability and subjective probability. **(4 Marks)**

(b) Explain **FOUR** characteristics of a normal distribution. **(8 Marks)**

(c) A project manager has determined that a subcontractor fails to deliver standard orders on schedule 20% of the time. The project manager has 6 orders that this subcontractor has agreed to deliver.

i) What is the probability that the subcontractor will deliver all of the orders? **(3 Marks)**

ii) What is the probability that the subcontractor will deliver at least 4 of the orders? **(3 Marks)**

iii) What is the average number of delivered orders? **(3 Marks)**

iv) What is the variability of the delivered orders? **(3 Marks)**

(d) Suppose KEBS is checking label specifications for a product. Suppose in a particular batch of 24 cans, 6 have contents that do not meet their label specifications. If KEBS selects 6 cans from the batch, what is the probability that it will find no mislabeled cans? **(6 Marks)**

QUESTION 2

(a) Distinguish between point estimate and interval estimate. **(4 Marks)**

(b) Cars arrive at a car wash at the average rate of 9 per hour. If the number of arrivals per hour follow the Poisson distribution, what is the probability of 15 or more arrivals during any given hour of operation? **(8Marks)**

(c) Crown Paints is evaluating the mean drying times of two types of paints. The results of the experiment are:

$\bar{X}_1 = 320\ minutes \qquad s_1 = 25\ minutes \qquad n_1 = 32$

$\bar{X}_2 = 350\ minutes \qquad s_2 = 29\ minutes \qquad n_2 = 37$

i) State the decision rule. **(2 Marks)**

ii) Compute the standard error of the difference. **(4 Marks)**

iii) Using the 5% significance level, test to determine whether there is difference between the mean drying times of the two types of paints. **(2 Marks)**

QUESTION 3

(a) Coca Cola company wants to know if children prefer a certain brand of Fanta in a blind taste test. Two hundred children are offered four different Fantas in identical containers and asked to indicate their favourite beverage. The results are:

Favourite Fanta	Passion	Orange	Blackcurrant	Strawberry
Number of children	60	43	46	51

i) State the null and alternative hypothesis. **(2 Marks)**

ii) Compute the degrees of freedom. **(4 Marks)**

iii) State the decision rule. **(2 Marks)**

iv) Use the 0.01 significance level to test if the children prefer one brand over the other. **(8 Marks)**

(a) A sample of 36 employees has a mean education level of 14 years with a standard deviation of 2 years. What is the standard deviation of the sampling distribution? **(4 Marks)**

QUESTION 4

Given the following data

Y	12	17	18	22	16	11	21	26
X	5	8	8	9	6	6	10	12

(a) Compute the correlation coefficient. **(6 Marks)**

(b) Interpret the results in part (a). **(2 Marks)**

(c) Compute the coefficients of the regression equation. **(8 Marks)**

(d) Suppose the value of X is 15, compute the value of Y. **(4 Marks)**

QUESTION 5

A production manager has a choice of three subcontractors from which to buy parts. The manager purchased 5 batches from each subcontractor, with the same number of items in each batch. The number of defectives per batch determined and the results are partially summarized below:

Source of variation	Sum of Squares SS	Degrees of Freedom df	Estimate of σ^2	F - ratio
Between groups	496.54	-	-	-
Within groups	333.20	-	-	
Total	-	14		

(a) State the null and alternative hypothesis **(4 Marks)**
(b) Complete the ANOVA Table. **(8 Marks)**
(c) Test the hypothesis at 0.01 significance level **(4 Marks)**
(d) What should the project manager conclude? **(4 Marks)**