KENYATTA UNIVERSITY

UNIVERSUTY EXAMINATIONS 2016/2017

SECOND SEMESTER FOR THE DEGREE OF BACHELOR OF ECONOMICS, ECONOMICS AND STATISTICS, ECONOMICS AND FINANCE, ARTS.

EES 301: STATISTICS FOR ECONOMISTS II

DATE: MONDAY 8TH MAY 2017 **TIME: 11:00 a.m. – 1:00 p.m.**

INSTRUCTIONS : ATTEMPT QUESTION ONE AND ANY OTHER TWO QUESTIONS

Question One(30marks)

a) Distinguish the following terms.
   i) Descriptive and inferential statistics (2marks)
   ii) Significant and insignificant difference in hypothesis testing (2marks0
   iii) Coefficient of correlation and coefficient of determination (2marks)
   iv) Standard error and sampling error (2marks)
   v) Installed Between sample and within sample as used in ANOVA (2marks)
   vi) Point estimation and confidence estimation (2marks)
   vii) T- distribution and z – distribution difference in terms of characteristics and appearance (4marks)

b) Highlight five steps you would follow in hypothesis testing (4marks)

c) Kamakwa Foods Inc is redesigning the checkout lanes in its supermarket throughout the country and is considering two designs. Tests on customer's checkout times conducted at two stores where the two new systems have been installed result in the following summary of the data

System A	System B
$n_1 = 120$	$n_2 = 100$
Mean of sample =4.1 minutes	Mean of sample = 3.4 minutes
Standard deviation = 2.2 minutes	Standard deviation = 1.5 minutes

Test the hypothesis to determine whether the population means checkout times of the two systems differ. Which system is preferred? $\alpha = 0.05$ (5marks)

d) A manufacturer claims that compared with his closest competitor, the propensity of his employees to join union is the same. Of 318 employees 117 are unionists. From a sample of 255 of the competitors' labour workforce, 109 are union members. What is your conclusion on his claim at $\alpha = 0.01$? (5marks)

Question Two (20marks)

a) Given the following three groups A, B and C.

A	B	C
24	30	35
26	56	60
32	65	76
38	80	90

Is there any difference in the means of the three groups $\alpha = 0.05$ (6marks)

b) Explain what you understand by central limit theorem. (4marks)

c) Given the population of women has normally distribute weights with a mean of 143 kg and a standard deviation of 29 kg. $\alpha = 0.05$?

i) If one woman is randomly selected find the probability that her weight is greater than 150 kg. (3marks)

ii) If 36 different women are randomly selected, find the probability that their mean weight is greater than 150 kg (3marks)

d) Suppose 60% of the population plan to vote for candidate X. what is the probability that an exit survey of 1000 people would show candidate X with less than 50% support? (4marks)

Question Three (20marks)

a) The table below gives corn produced with fertilizer used in 10 towns in Kenya.

Town	Corn (Y_i)	Fertilizer (X_i)
Wote	40	6
Voi	44	10
Machakos	46	12
Kilifi	48	14
Athi River	52	16
Thika	58	18
Kisumu	60	22
Embu	68	24
Eldoret	74	26
Nakuru	80	32

Using the information:

i) Find the regression equation for the corn produced with fertilizer used. (8marks)

ii) Interpret the results of your regression model (2marks)

iii) Find the correlation coefficient of the estimated regression equation (5marks)

b) A producer of steel cables wants to test if the steel cables it producers has a breaking strength of 5000 lbs. a breaking strength of less than 5000 lb would not be adequate and to produce steel cables with breaking strengths of more than 5000 lb would unnecessarily increase production costs. The producer takes a random sample of 64 pieces and finds that the average breaking strength is 5100 lb and the sample standard deviation is 480 lb. should the producer accept the hypothesis that the steel cables have a breaking strength of 5000 lb at 5% level of significance? (5marks)

Question Four (20 marks)

a) Highlight the main characteristics of a good estimator. (4marks)

b) A firm wants to know with a 95% level of confidence if it can claim that the boxes of detergents it sells contains more than 500 gm of detergent. From past experience, the firm knows that the amount of detergent in the boxes is normally distributed. The firm takes random sample of n=25 and finds the mean to be 520 gm with a standard deviation of 75 gm (4marks)

c) What is meant by type I and type II errors (2marks)

d) Outline the steps when testing the difference in means between two samples (5marks)

e) The following table contains data on the number of customers a shop has on each day of the week.

Day of the week	Number of customers
Monday	95
Tuesday	81
Wednesday	84
Thursday	120
Friday	117
Saturday	110
Sunday	93

Does the number of customers occur uniformly throughout the week? (5marks)

Question Five (20marks)

a) Outline the reasons for sampling as compared to conducting census in a research (5marks)

b) A visitor to Nairobi found that the average price of a hotel in the city is kshs. 884.2 while in the surrounding areas is kshs. 806.1. Assume that the data were obtained from two samples of 50 hotels each and the standard deviations were kshs. 56.2 and kshs. 48.3 respectively, can it be concluded that there is a significant difference in the prices? Use a 5% level of significance (5marrks)

c) A teacher gave attest to 10 students in her class and 7 of them passed. A quality assurance officer later visited the teacher's class and sampled out 3 students at random. Determine the following:

i) The standard error of the sampling distribution of the proportion. (3marks)

ii) The probability that between 40% and 60% of the students passed the test (4marks)

iii) The probability that more than 60% of the class passed the test (3marks)