(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2018/2019 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

MAIN/SPECIAL/SUPPLIMENTARY EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: BCO 318:

COURSE TITLE: MANAGERIAL STATISTICS

DATE: 04/08/2019   **TIME:** 4.00 P.M

TIME: 2 Hours

KIBUCO observes ZERO tolerance to examination cheating

Answer Question One in Section A and Any other TWO (2) Questions in Section B

SECTION A (COMPULSORY)

1. Ten accounting workers in Wakulima Factory were interviewed on their monthly salaries status and the data collected is given below:

Salary sh.('000)	No of workers
11	5
37	3
25	3
62	2
51	2
21	3
18	0
43	2
32	3
20	1

a) Calculate the mean and standard deviation of the worker's salaries. (2 marks)

b) Give a 95% confidence limit for the mean salary. (2 marks)

c) Describe the main features of a continuous normal distribution   (2 marks)

d) The following table shows the number of motor registrations provided by the Kenya Bureau of Statistics for a term of 5 years and the sale of motor tires by Kwetu Tyres Limited for the same period.

Year	Motor Registrations	No. of Tyres Sold
1	600	1,250
2	630	1,100
3	720	1,300
4	750	1,350
5	800	1,500

a) Find the regression equation to estimate the sale of tires when the motor registration is known.   (4 marks)

b) Estimate sales of tires when motor registration is 850 units. (4 marks)

c) If a random sample of 25 tires with standard deviation of 30 is picked from a population known to have a mean of 1000 that is randomly distributed, find the 99 % confidence interval for the unknown population. (3 marks)

d) Examine any THREE assumptions that you may need to test before conducting multiple regression analysis   (6marks)

e) Discuss the conditions for using the following statistical tests and in each case formulate an appropriate null hypothesis

i) Chi-Square of fit test

ii) One way Anova

iii) Two sample t- test   (6 marks)

SECTION B (CHOOSE ANY TWO QUESTIONS)

QUESTION TWO

i) Suppose that the Energy Corporation of Kenya wishes to use $p=3$ independent samples of fuel mileages to compare the locations of the populations of all fuelmileages that could be obtained by using petrol brands;ordinary,super and premium.The petrol brands data is given below:

Ordinary	super	premium
34.0	35.3	33.3
35.0	36.5	34.0
34.3	36.4	34.7
35.5	37.0	33.0
35.8	37.6	34.9

Use Kruskal-Wallis H Test to test at 5% level of significance the hypothesis that the petrol brands population differ in location.   4 marks

ii) Explain four reasons why it is advisable to use random sampling rather than a census in studying a population. 4 marks

iii) A quality inspector picks a sample of 10 tubes at random from a very large shipment of tubes known to contain 20% defective tubes.

   a) What is the probability that no more than 2 of the tubes picked are defective? 8 marks

   b) Differentiate between Type I and Type II error.4 marks

QUESTION THREE

a) A promotional campaign for a new product indicated a liking propotion of o.6. in a sample of Past experience indicates that an average number of 6 customers per hour refuel at a petrol station in Kanduyi.Determine the probability of

   i) 3 Customers refueling in an hour.2.5 marks

   ii) 3 customers or less fueling in any one hour2.5marks

iii) Compute the expected mean and standard deviation of this distribution
   1   (Mark)

b) In the past 20% of the TVs sold in an electronic shop were small screen, 35 % were medium, and 45 % were large. In order to determine the stock to maintain of each type of TV set, the manager takes a random sample of 100 TVs that were recently purchased and finds that 12 were small screen,64 were medium and 24 were large. Test at 5 % level of significance the hypothesis that the past pattern of sales H_0 still prevails.   10 marks.

QUESTION FOUR

a) Explain characteristics of a good estimator.   (6 marks)
b) The management of the ABC Bank wants to test the effectiveness ofan advertising company that is intending to enhance the awareness of the bank's servicefeatures. It administered a questionnaire before the advertising campaigndesigned tomeasure the awareness of services offered. After the advertising campaign, the bankadministered the same questionnaire to the same group of people. Both the before and afteradvertising campaign scores are given in the following table.

Consumer awareness of bank services offered

Consumer	1	2	3	4	5	6	7	8	9	10
Before advertising campaign	82	81	89	74	68	80	77	66	77	75
After advertising campaign	87	84	84	76	78	81	79	81	81	83

Use Wilcoxon matched-pairs test, to test at 5% level f significance the hypothesis that there is no difference inawareness of services offered after the advertising campaign. (9 marks)

QUESTION FIVE

2a) The following data indicates the lifetime (in hours) of samples of two kinds of light bulbs in continuous use.

Brand A	603	625	641	622	585	593	660	600	633	580	615	648
Brand B	620	640	646	620	652	639	590	646	631	669	610	619

Use the Mann-whitney test to compare the lifetimes of brands A and B light bulbs.

(10marks)

b) Designed experiments have many potential uses in improving processes and products. Briefly Discus any FIVE purpose of experimentation   (10 marks)

QUESTION SIX

3a) An article about driving practices in Nairobi County claimed that 48% of drivers did not stop at stop sign intersections on roads. Two months later, a follow-up study collected data in order to see whether this percentage had increased.

i)Formulate the hypotheses to check if the proportion of people who did not stop had increased

(5marks)

ii) Assume the study found 360 out of 800 drivers did not stop at stop sign intersections. What is the sample proportion? What is the p- value   (6marks)

b) Statisticians use a **confidence interval** to express the precision and uncertainty associated with a particular sampling method. A confidence interval consists of three parts. Discus this parts   (9marks)

QUESTION SEVEN

4a) Suppose that three groups of salesmen (being employees of a company) underwent training. The method of training was different for each group. When training was completed, the salesmen were given a test. The marks they scored are shown below:

Training method A   75   83   68   85   90   61

Training method B   62   70   67   82   80   87   64

Training method C   65   71   74   63   89

Use the kruskal-wallis test to find out whether there was difference in the effectiveness of the three training methods   (10marks)

b) Give brief definition of the following terminologies

i)   Statistics

ii)   Estimation

iii)   Sampling

iv)   Hypothesis

v)   Probability

                                                   (10marks)