MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

DEPARTMENT OF FASHION DESIGN AND MARKETING

THIRD YEAR SUPPLEMENTARY EXAMINATIONS FOR
BACHELOR FASHION DESIGN AND MARKETING AND CRM

HCU 301-INTRODUCTION TO STATISTICS

DATE: 27/9/2019   **TIME: 11:00 – 1:00 PM**

Instruction: Attempt question ONE and any other TWO questions

QUESTION ONE (30 MARKS)

(a)   Explain the meaning of the following terms as applied in Statistics

      (i)   Population

      (ii)   Variable

      (iii)   Null hypothesis   (3 marks)

b)   Differentiate between each of the following terms:

      (i)   Nominal and interval measurement scales

      (iii)   Type I and Type II errors as used in test of hypothesis   (4 marks)

c)   The table below shows marks scored by students in a statistics examination

Class	40-44	45-49	50-54	55-59	60-64
Frequency	6	10	25	11	2

      Calculate the mean and standard deviation   (7 marks)

d)   A study of 49 randomly chosen 8-year-olds shows that they watch television an average of 38 hours per week with a standard deviation of 6.4 hours. Assuming normal distribution, construct a 99% confidence interval for the average time per week that all such children watch television   (6 marks)

e) A marketing research group reports that a typical supermarket shopper spends an average of ksh 1400 per week on groceries. A sample of 50 randomly selected shoppers spends an average of ksh 1540 with a standard deviation of ksh 620 per week. At 5% level of significance, tests if the report is correct? (6 marks)

f) Two true six-sided dice are rolled, what is the probability of a total score of 8. (4 marks)

QUESTION TWO

a) The data below shows the number of hours worked in one week by employees in certain textile company

46.3   39.2   44.2   41.3   45.1   42.3   43.5   40.0

45.6   40.6   42.0   42.6   45.6   39.5   43.1   39.7

46.1   38.9   42.4   42.1   45.0   44.4   42.4   40.8

Tabulate a frequency distribution table with class intervals by 38.9 – 40.4, … etc

(6 marks)

b) Use the table in 2(a) above to calculate the:

      (i)   quartile deviation (8 marks)

      (ii)   mode (3 marks)

      (iii) median (3 marks)

QUESTION THREE

a) The mean weight of a consignment of 500 barrels of second hand shoes is 151kg and a standard deviation of 15kg.If the weight are normally distributed determine how many barrels weigh

      (i)   Between 120kg and 155kg (4 marks)

      (ii)   More than 185kg (3 marks)

      (iii) Less than 128kg (3 marks)

b) A supermarket owner is studying how the average waiting time in minutes for customer checkout depends on the number of checkout clerks working. The results are shown below

No of clerks on duty (x)	3	4	5	5	6	7
Waiting time (y)	9	6	6	4	2	1

Determine the linear least squares regression equation for waiting time as a function of the number clerks on duty. (10 marks)

QUESTION FOUR

(a)   A small company is interested in analyzing the effects of advertising on its sales, over a 5-month period. The results are as follows

Advertising (x)	5	8	10	15	22
Sales (y)	6	15	20	30	39

Calculate the correlation coefficient between sales and advertising.   (8 marks)

(b)   A consumer research organization conducts a survey of drivers to determine if there is any difference in their choice of brand of Japanese-made cars based on their gender as shown below

	Toyota	**Subaru**	**Nissan**
Women	70	80	150
Men	40	60	100

i)   Construct the corresponding table of expected frequencies.   (6 marks)

ii)   Determine the value of the chi-square statistic.   (6 marks)

QUESTION FIVE

a)   Explain the meaning of each of the following terms as used in probability theory.

   i)   Random experiment
   ii)   An event
   iii)   Mutually exclusive events
   iv)   Independent events.   (8 marks)

b)   Given the following set of data, construct the analysis of variance (ANOVA) table

          (12 marks)

A	B	C
15	18	6
10	20	15
15	22	10