MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS 2018/2019 ACADEMIC YEAR
FOURTH YEAR FIRST SEMESTER

SCHOOL OF BUSINESS AND ECONOMICS
BACHELOR OF SCIENCE IN ECONOMICS AND STATISTICS

COURSE CODE: ECS 4103
COURSE TITLE: APPLIED STATISTICS

DATE: 10TH DECEMBER 2018   TIME: 0830 – 1030 HOURS

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE** and any other **THREE** questions

Question One

(a) Explain the significance of statistics in production **(6marks)**

(b) Consider the data below which shows the quantity of sugar in millions of tones (Y) per year and the value of out of dollars per ton, (X)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quantity supplied million ton (y)	5	4	3	4	7	9	8	10	8	2
Value of output $ per ton (X)	2	4	2	3	8	7	6	8	7	3

   i. Using this data estimate the regression equation of Y on X **(7marks)**

   ii. Test the hypothesis that the regression coefficient is significant at 5% level **(7marks)**

   iii. What percentage of the variation in Y is explained by variation in X **(5marks)**

Question Two

From the sample below:

   a) Calculate the variance of the estimates **(8marks)**

   b) Test the significance of b_1 and b_2 at 5% level of significance. **(7marks)**

year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Y	40	44	46	48	52	58	60	68	74	80
X_1	6	10	12	14	16	18	22	24	26	32
X_2	4	4	5	7	9	12	14	20	21	24

Question Three

(a) Given a sample with a mean $\mu = 100$ and variance $\delta = 81$, and a random sample of n = 25 is obtained. What is the probability that the sample mean lies between 98 and 101? **(5marks)**

(b) Given a population with a mean of 400 and a variance of 16. If a sample of 35 is obtained,

ECS 4103 – Applied Statistics

i. What is the probability that sample mean will be more than 412.

(5marks)

ii. What is the probability that sample mean will be less than or equal to 389

(5marks)

Question Four

The table below gives real per capita income in thousands of dollars Y with the percentage of labour force in agriculture X_1 and average years of schooling of the population over 25 years of age X_2 for 10 developed countries in 2018.

n	1	2	3	4	5	6	7	8	9	10
Y	6	8	8	7	7	12	9	8	9	10
X_1	9	10	8	7	10	4	5	5	6	8
X_2	8	13	11	10	12	16	10	10	12	14

a) Find the partial correlation coefficient between Y and X_1 **(7marks)**
b) Find the partial correlation coefficient between Y and X_2 **(7marks)**
c) Which of the two exogenous variables contribute more to the explanatory power of the model? **(1mark)**

Question Five

(a) A researcher wishes to estimate the mean weekly wage of the several thousands of workers employed in a firm within plus or minus Sh 20 and with a 99% degree of confidence. From past experience, the researcher knows that the weekly wages of these workers are normally distributed with a standard deviation of Sh 40. What is the minimum sample size required. **(5marks)**

(b) Given the following

Income	138	152	104	112	114	154	116	110	134	106	114	128
Expenditure	18	24	12	20	18	20	14	16	24	12	22	16

Calculate the income elasticity of expenditure **(10marks)**

....**END**..