UNIVERSITY OF SWAZILAND
FACULTY OF SOCIAL SCIENCE
DEPARTMENT OF ECONOMICS

SUPPLEMENTARY EXAMINATION PAPER: JULY 2017

TITLE OF PAPER: STATISTICS FOR ECONOMISTS
COURSE CODE: ECON 209
TIME ALLOWED: TW0 (2) HOURS

INSTRUCTIONS:

1. Answer Question **one** and any other **two** Questions to make a total of **three**

2. Show all relevant workings to your answer

3. Question 1 is 30 marks and the other Questions carry a total of 25 marks each.

SPECIAL REQUIREMENTS: SCIENTIFIC CALCULATOR

DO NOT OPEN THIS QUESTION PAPER UNTIL INSTRUCTED TO DO SO BY THE INVIGILATOR

Question 1:   THIS QUESTION IS COMPULSORY

Write explanatory notes on the following concepts
   a) Classical and logical interpretations of probability
   b) Discrete random variable and continuos variable
   c) The difference between non-mutually exclusive events and non-dependent events.
   d) The three conditions that a test statistic must satisfy
   e) Level of significance and level of confidence
   f) Give reasons why in an econometric study a researcher will add a random error term to its theoretical (economic) model.

                                                        [5 marks each]

ANSWER ANY TWO FROM THE FOLLOWING QUESTIONS

Question 2:

   a) If A, B, C, are three events, find expressions for the events that out of A, B, C

      i.   Only A occurs
      ii.   Both A and B, but not C occur
      iii. All three occur
      iv.   At least one occurs
      v.   One and no more occurs
      vi.   None occurs

                                                        [3 marks each]
   b) An investor has funds in Standard bank and Barclays Bank. He assesses the probability that in five years time, Standard bank will fail at 0.0001 and assigns the same failure probability to Barclays. Further, this businessman thinks the probability that both banks will fail is 0.00001.

      i.   What is the probability that Standard or Barclays will fail?
                                                        [2 marks]
      ii.   Are the events Standard Bank fails and Barclays Bank fails independent? Why?   [4 marks]
      iii. What is the probability that Barclays Bank fails if Standard Bank fails?   [1 mark]

2

Question 3:

a) Certain tubes manufactured by a company have a mean lifetime of 800hours and standard deviation of 60 hours. Find the probability that a random sample of 16 tubes taken from the group will have a mean lifetime

    i.   between 790 and 810 hours
    ii.   less than 785 hours
    iii. more than 820 hours
    iv. between 770 and 830 hours

[3 marks each]

b) The Swaziland Revenue Authority took a complete census of personal income tax paid by the residents of the City of Mbabane in 2013. The mean and standard deviation of this variable were found to be μ=E2180 and sigma= 1.816. If a sample of 64 taxpayers is taken at random what is the probability that their sample mean is no more than E300 from the universe mean? [6 marks]

c) A manufacturer claims that the average life of batteries produced by his firm is 30 months. You disagree, contending that the average life of the batteries is less than 30 months. A random sample of 81 batteries has a mean of 28.7 months and a standard deviation of 8 months.Perform the appropriate hypothesis test. Use a significance level of 0.05.

[7 marks]

Question 4:

SkyWorld Travel has recently employed a marketing and sales manager in an effort to improve its sales position. It is believed that advertising plays an important role in improving sales in the company. The manager decides to investigate if there is really a relationship between sales and advertising costs. A random sample of 10 companies was taken and asked to state the amount spent on advertising and the corresponding sales of the product. Suppose the following data were obtained from the survey:

Company	Sales (E000's)	Advertising costs (E00's)
A	25	8
B	35	12
C	29	11
D	24	5
E	38	14
F	12	3
G	18	6
H	27	8
I	17	4
J	30	9

a) find the equation of the regression line of sales on advertising costs and draw it. [15 marks]
b) calculate the standard error of estimate. [5 marks]
c) calculate the coefficient of determination and explain it [5 marks]

Question 5:

Briefly explain the following concepts indicating their importance in econometric analysis:

a) correlation coefficient
b) autocorrelation
c) BLUE OLS estimates
d) Coefficient of determination
e) Multicollinearity

[5 marks each]

4