Uva Wellassa University
Faculty of Animal Science & Export Agriculture
BSc in Export Agriculture

End Semester Examination – July/ August 2016
Year IV Semester I

Econometrics (EAG 330-2)

Instructions

Answer **all** questions.
No. of questions : Two (02)
No. of pages : Twelve (12)
Total marks allocated : 40%
Time : One hour (01 hr)

Part I – Structured

1.

a. Define the following (04 Marks)

i. Data

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ii. Variables

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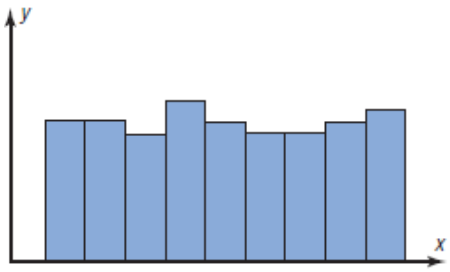
b. Classify each variable as nominal, ordinal, interval, or ratio measurement

(10 Marks)

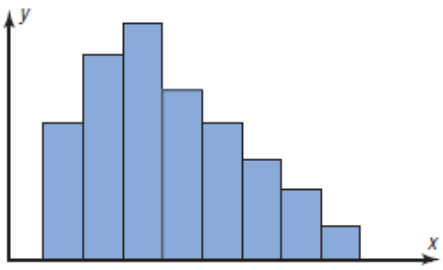
Description	Type of Measurement
Pages in the 25 best-selling mystery novels	
Rankings of golfers in a tournament	

Temperatures inside 10 pizza ovens	
Weights of selected cell phones	
Salaries of the football coaches in Badulla	
Times required to complete a chess game	
Ratings of textbooks (poor, fair, good, excellent)	
Number of amps delivered by battery chargers	
Ages of childern in a day care center	
Categories of magazines in a physician's office (sports, women's, health, men's, news).	

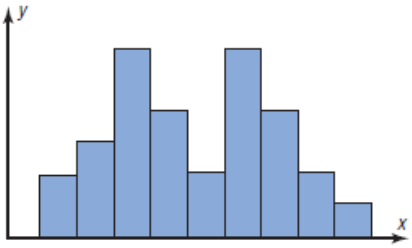
c. When one is describing data, it is important to be able to recognize the shapes of the distribution values. Given below are five (5) such shapes. Identify and name them (05 Marks)



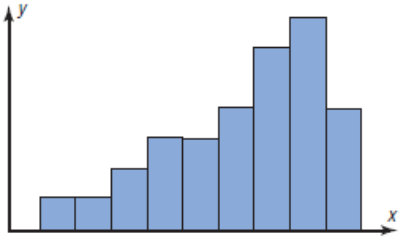
i. ……...



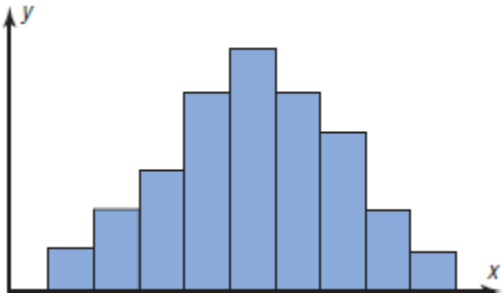
ii.……



iii. ……...



iv.……



v. ……...

d.

i. What are the most popular measures of central tendency? (06 Marks)

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ii. The following data represent the duration (in days) of U.S. Space Shuttle voyages for the years 1992-1994. Find the above mentioned measures. (06 Marks)

8, 9, 9, 14, 8, 8, 10, 7, 6, 9, 7, 8, 10, 14, 11, 8, 14, 11

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iii. From the above measures what is resistant to outliers and what is sensitive to outliers? (03 Marks)

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e.

i. What is meant by standard deviation? (05 Marks)

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ii. The distribution of heights of young adult women is approximately normal with mean 64.5 inches and standard deviation of 2.5 inches.

A. Write the above description in notation form. (02 Marks)

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B. Write the 68-95-99.7 rule. Use graphical illustrations where necessary to support your answer. (15 Marks)

Rule I

Rule II

Rule III

f. A food scientist is interested in comparing the sodium content of real cheese with the sodium content of a cheese substitute. The data for two random samples are shown below. Compare the distribution using box plots.

(10 Marks)

Real Cheese	Cheese Substitute
310 420 45 40	270 180 250 290
220 240 180 90	130 260 340 310

g. Identify a method of analysis, a model or a statistical test for the given practical situations (30 Marks)

Hint: You may use t tests (paired t test, pooled test etc.), Z-test, χ^2 test, regression analysis, Co-relation coefficient etc.

i. To test whether there is an association between the height and the girth of plants measured in cm.

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ii. To test whether there is a difference between plant heights in two nurseries.

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iii. To test whether there is a significant weight reduction of 20 participants after an aerobic exercise program.

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iv. To test whether there is an association between latex yield of rubber trees and the girth of the tree.

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v. To test whether there is a significant yield difference between two rice varieties cultivated in Rambukpotha area.

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vi. To test whether there is an association between gender of the children and color preference in buying plastic toys.

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vii. To test whether there is a difference between 'Z' scores of A/L examination of the first year students and the second year students.

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viii. To test whether there is an association between preference to choose varieties of fruits and 'education level' of the buyers.

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ix. To test whether there is a difference between body weights of grade five students in two schools.

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x. To test whether there is an association between gender and preferences for four different colours of containers of ice-cream.

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xi. To test whether there is a significant difference of 'Grade Point Average (GPA) between girls and boys in the third year batch.

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xii. To test whether there is a relationship between monthly expenditure for mobile phone charges and Overall Grade Point Average (OGPA) of the third year students.

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xiii. To find the probability that any given day the sale of bread is greater than 75 loaves if daily sale of bread in a bakery follows a normal distribution with a mean of 70 and a variance of 9

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xiv. You need to test the hypothesis which states that mean weight of population is 120 ponds if nine individuals are chosen from a population and their weights are found to be in pounds.

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xv. You need to find the factors affecting willingness to pay to maintain the quality of Dunhinda waterfall by the residents in Dunhinda area and the visitors.

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h. Classify given samples as random, systematic, stratified, or cluster. (04 Marks)

Description	Method of Sampling
In a large school district, all teachers from two buildings are interviewed to determine whether they believe the students have less homework to do now than in previous years	
Every seventh customer entering a shopping mall is asked to select her or his favorite store	
Nursing supervisors are selected using random numbers to determine annual salaries	
Mail carriers of a large city are divided into four groups according to gender (male or female) and according to whether they walk or ride on their routes. Then 10 are selected from each group and interviewed to determine whether they have been bitten by a dog in the last year	

2. The following Stata output shows an example of a regression analysis. These data were collected on 200 high schools students and are scores on various tests, including science math, reading and social studies (**socst**). The variable **female** is a dichotomous variable coded 1 if the student was female and 0 if male.

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      Source |       SS       df       MS              Number of obs =     200
-------------+------------------------------           F(  4,   195) =   46.69
       Model |  9543.72074     4  2385.93019            Prob > F      =  0.0000
    Residual |  9963.77926   195  51.0963039            R-squared     =  0.4892
-------------+------------------------------           Adj R-squared =  0.4788
       Total |     19507.5   199  98.0276382            Root MSE      =  7.1482

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     science |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        math |   .3893102   .0741243     5.25   0.000      .243122    .5354983
      female |  -2.009765   1.022717    -1.97   0.051    -4.026772    .0072428
       socst |   .0498443    .062232     0.80   0.424    -.0728899    .1725784
        read |   .3352998   .0727788     4.61   0.000     .1917651    .4788345
       _cons |   12.32529   3.193557     3.86   0.000     6.026943    18.62364
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a. Is the model significant? Justify your answer (10 Marks)

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b. Distinguish between R-squared and Adj R-squared (10 Marks)

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c. Can you be satisfied with the estimated R-squared? Justify your answer (10 Marks)

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d. What are the significant parameters? You need to state the α level that you consider in finding the significant parameters? (10 Marks)

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e. How do you interpret the results in relation to the following predictors? (20 Marks)

i. math

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ii. female

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iii. socst

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iv. read

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f. State the hypothesis in relation to the following (10 Marks)

i. Prob > F

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ii. P>|t|

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g. How do you get the F-statistics using the ANOVA table provided with Stata output? (05 Marks)

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h. What is meant by the standard error (**Std. Err.)** of the estimate? (05 Marks)

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i. Write down the estimated regression equation (05 Marks)

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j. Estimate the science score for a male student and a female student if scores obtained for math, reading and social studies are 65, 89, and 73 respectively (05 Marks)

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k. The above regression model has been estimated using the Ordinary Least Square (OLS) method. (10 Marks)

i. What is meant by OLS?

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ii. State another method used in estimating the unknown parameters in a regression model

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