UVA WELLASSA UNIVERSITY OF SRI LANKA
FACULTY OF ANIMAL SCIENCE & EXPORT AGRICULTURE

BSc in Export Agriculture
Fourth Year First Semester Examination – July/ August 2018

Econometrics (EAG 402-2)
Section I – Structured Questions

Instructions:
Answer **all** questions in the given space.
No. of questions : Two (02)
No. of pages : Thirteen (13)
Time : One (01) hour
Total marks allocated : 40%

Index No.

1.

(I) Identify a suitable regression model for the given practical situations;

(03 marks X 15 = 45 marks)

a) People's occupational choices might be influenced by their parents' occupations and their own education level. We can study the relationship of one's occupation choice with education level and father's occupation.

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b) A marketing research firm wants to investigate what factors influence the size of soda (small, medium, large or extra large) that people order at a fast-food chain.

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c) A study looks at factors that influence the decision of whether to apply to graduate school. College juniors are asked if they are unlikely, somewhat likely, or very likely to apply to graduate school.

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d) Suppose that we are interested in the factors that influence whether a political candidate wins an election.

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e) Suppose You need to find the relationship between the milk yield per day of cow and their diet intake per day

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f) A researcher is interested in how variables, such as GRE (Graduate Record Exam scores),GPA (grade point average) and prestige of the undergraduate institution, effect admission into graduate school.

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g) Regarding the number of awards earned by students at one high school, predictors of the number of awards earned include the type of program in which the student was enrolled (e.g., vocational, general or academic) and the score on their final exam in math.

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h) A biologist may be interested in food choices that alligators make. Adult alligators might have different preferences from young ones.

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i) Suppose that we are interested in the factors that influence whether a political candidate wins an election

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j) A research project is studying the level of lead in home drinking water as a function of the age of a house and family income. The water testing kit cannot detect lead concentrations below 5 parts per billion (ppb). The Environmental Protection Agency (EPA) considers levels above 15 ppb to be dangerous.

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k) Suppose you want to find the yield of sugar beet for which 14 different amounts of fertilizer were applied to separated plots of sugar beet crop

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l) Suppose you want to find the determinants of migration locally or internationally

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m) A research want to find the technical efficiency of the 100 paddy farmers

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n) A researcher want to find the impact of migration and remittances on the total household income and subsequently the poverty and income inequality

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o) A sales manager gathered information on the number of sales calls made and the number of copiers sold for a random sample of 15 sales representatives. As a part of her presentation at the upcoming sales meeting, Ms. Bancer, the sales manager, would like to offer specific information about the relationship between the number of sales calls and the number of copiers sold

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(II) Provide a practical example for each of the following tests

(05 marks X 4 = 20)

a) Student t-test

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b) Paired t-test

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c) Pooled t-test

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d) Chi-square test

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(III) The following table shows a regression model that has been estimated to find the agro climatic variables on the samba rice yield.

Variable notation	**Model**	**Regression coefficients**	**t value**	**Significant value**
	Constant	2.96	2.567	.026
X_1	Maximum temperature (^{0}C)	5.544	3.08	.01
X_2	Average temperature (^{0}C)	-5.584	-3.108	.01
X_3	Diurnal temperature range (^{0}C)	-2.749	-3.074	.011
X_4	Total rainfall of the week (mm)	-.00258	-.971	.353
X_5	Cumulative rainfall for the season up to the week (mm)	.0001457	.126	.902
X_6	Net solar radiation (cal/cm^2.day)	-.00174	-2.322	.040
X_7	Fertilizer (‘000 Mt.)	-.000012	-1.649	.127
X_8	Price (Rs per 100 kg)	-.000063	-2.115	.058
X_9	Time (Year)	.06121	2.863	.015
	R^2	.67		
	Adj R^2	.62		
	F	2.487**		
	Prob > F	0.0000		

a) Is the model significant? Justify your answer. (05 marks)

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b) Can you be satisfied with the estimated R-squared? Justify your answer. (05 marks)

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c) What are the significant parameters? You need to state the α level that you consider in finding the significant parameters? (05 marks)

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(IV) How do you interpret the results in relation to the following predictors?

(4 X 05 marks = 20 marks)

a) Maximum temperature(^{0}C)

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b) Average temperature (^{0}C)

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c) Total rainfall of the week (mm)

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d) Net solar radiation (cal/cm^2.day)

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e) Fertilizer (‘000 Mt.)

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2.

(I) The body of knowledge called statistics is sometimes divided into two main areas, depending on how data are used. Those two (02) main areas are; (02 marks)

a) …….

b) …….

(II) What is meant by those two (02) mentioned in question (I)?

(02 marks X 2 = 04 marks)

a) …….

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b) …….

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(III) Define the followings; (05 marks X 2 = 10 marks)

a) Population

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b) Sample

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(IV) Classify given samples as random, systematic, stratified, or cluster sampling method (04 marks)

Description	**Method of Sampling**
Subjects are selected by dividing up the population into groups, and subjects are randomly selected within groups.	
Subjects are selected by using every k^{th} number after the first subject is randomly selected from 1 through *k*.	
Subjects are selected by random numbers.	
Subjects are selected by using an intact group that is representative of the population.	

(V) How do you explain the following methods of sampling?

(05 marks X 3 = 15 marks)

a) Purposive sampling

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b) Snowball sampling

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c) Convenience sampling

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(VI)

a) What is a hypothesis? (05 marks)

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b) What is meant by hypothesis testing? (05 marks)

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c) List down the steps in hypothesis testing. (08 marks)

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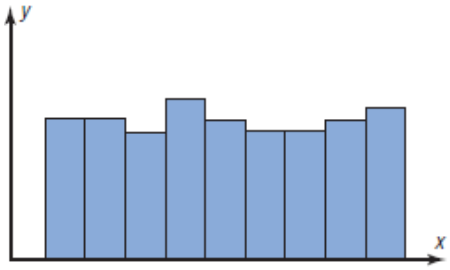
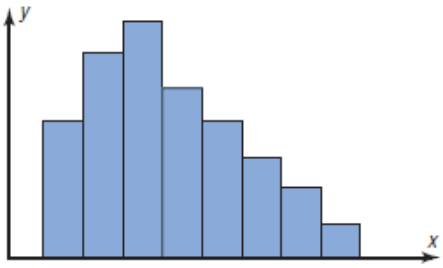
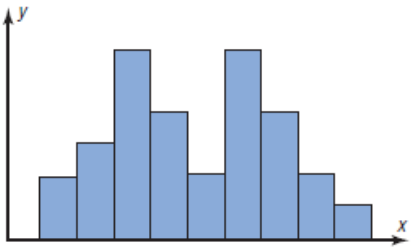
(VII) When one is describing data, it is important to be able to recognize the shapes of the distribution values. Given below are five (5) such shapes. Identify and name them (05 marks)



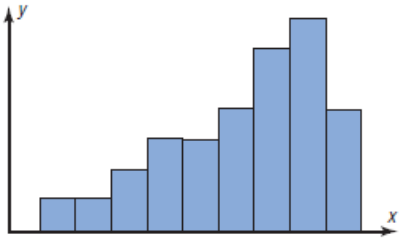
i. ……...



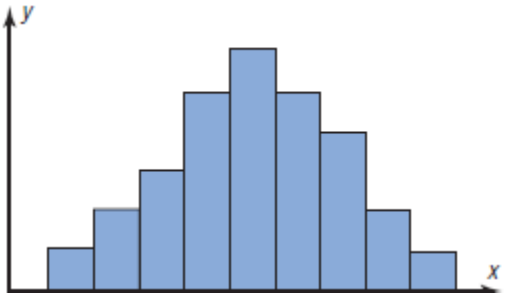
ii……



iii. ……...



iv……



v. ……...

(VIII)

a) What are the most popular measures of central tendency? (06 marks)

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b) 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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c) From the above measures what is resistant to outliers and what is sensitive to outliers? (03 marks)

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(IX)

a) What is meant by standard deviation? (05 marks)

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

i. Write the above description in notation form. (02 marks)

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

Rule I

Rule II

Rule III

(X) 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.

(05 marks)

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