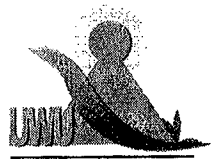


Uva Wellassa University
Faculty of Animal Science & Export Agriculture
BSc in Export Agriculture



**Uva Wellassa
University**

End Semester Examination March /April 2013
Year IV Semester I

Econometrics EAG 423 - 2

Instructions

Answer all the questions

- No. of questions : Five (05)
- No .of pages : Four (04)
- Time : 02 hours
- Total marks allocated: 100 %

Index No:

Question 01

(20 marks)

I. There are 250 employees in a factory. The table shows the number of each type of employee in the factory.

Managers	Administrators	Craftsmen	Laborers
25	41	130	54

- a. Describe a method to obtain a stratified sample from the employees in the factory.
- b. If the required size of the stratified sample is 40, calculate the number of each type of employee to be chosen.

II. Suppose a group of measurements of productivity in 24 different manufacturing plants was as follows.

20 50 30 30 30 70 30 50 30 40 30 30
 40 30 30 50 20 30 20 50 40 40 50 30

- Construct a stem & leaf plot of this list.
- What are the quartile values?
- What is the inter quartile range (IQR)?

Question 02

(20 marks)

Two different samples of paddy farmers were randomly selected from Galgamuwa area and knowledge about new farming technologies was disseminated using two different extension methods. Below table shows details about the average paddy yield of farmers after the extension programme.

	Sample I	Sample II
Sample size (n)	30	20
Average yield (\bar{X}) (t /ha)	3200	3300
Sample standard deviation (S)	80	90

Test whether there is a significant difference between two different extension methods at 5% significance level.

Question 03**(20 marks)**

Below is a set of data for income (X) and consumption (Y) of a person in Sri Lanka (measured in SLR):

Income (X)	10	20	30	40	50	60	70	80	90	100
Consumption (Y)	30	25	61	57	60	64	55	64	65	75

- Draw a scatter diagram of income (X) against consumption (Y)
- Calculate the equation of the regression line of X on Y and draw the line on the diagram.
- What is the significance of the values of the intercept "a" and the gradient "b" in this case?
- Use the regression equation to predict the consumption if the income is (i) 120 (ii) 150 (iii) 65
- Calculate the correlation coefficient.

Question 04**(20 marks)**

An automatic bottling machine fills cola into two liter (2000 cc) bottles. A consumer advocate wants to test the null hypothesis that the average amount filled by the machine into a bottle is at least 2000 cc.

A random sample of 40 bottles coming out of the machine was selected and the exact amount of the selected bottles is recorded. The sample mean was 1999.6 cc. The population standard deviation is known from past experience to be 1,30 cc.

Test the null hypothesis at the 5% significance level.

Question 05

(20 marks)

A researcher developed an empirical model for one of his research studies as follows.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 D_1 + \beta_6 D_2 + \beta_7 X_5 + \beta_8 X_6 + \epsilon_i$$

D1 & D2 are dummy variables.

Minitab regression results of the study are given below. Make use of these results and answer the questions below.

Predictor	Coef	SE Coef	T	P
Constant	47.453	6.534	7.26	0.000
X1	-0.06085	0.09993	-0.61	0.546
X2	0.2140	0.8885	0.24	0.811
X3	0.5400	0.2374	2.27	0.029
X4	6.060	2.022	3.00	0.005
D1	1.555	2.318	0.67	0.507
D2	0.998	4.174	0.24	0.812
X5	-9.093	2.681	-3.39	0.002
X6	8.020	3.133	2.56	0.015

S = 6.39480 R-Sq = 79.4% R-Sq(adj) = 74.8%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	8	5659.78	707.47	17.30	0.000
Residual Error	36	1472.17	40.89		
Total	44	7131.94			

- Write the estimated regression equation for full model with all variables.
- Is the model significant? Give reasons.
- Select the significant variables at 5% probability level.
- What is explained by R-Sq(adj) = 74.8%
- Give an economic interpretation to the estimated parameters (coefficients).