Eastern University, Sri Lanka
Second Year First Semester Examination in Agriculture – 2012/2013
(March -2015)
CS 2102: Introductory Statistics

Answer **ALL** Questions

Time allowed: 02 Hours

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1)

a) Consider the following hypothesis test:

$$H_0 : \mu = 295$$
$$H_1 : \mu \neq 295$$

A sample of 50 provided a sample mean of 297.6. The population standard deviation is 12.

i) Compute the value of test statistic.
ii) What is the *p*-value?
iii) At $\alpha = 0.05$, what is your conclusion?
iv) What is the rejection rule using the critical value? What is your conclusion?
v) Compute a 95% confidence interval for the population mean. Does it support your conclusion?

b) Consider the following hypothesis test:

$$H_0 : \mu \leq 7$$
$$H_1 : \mu > 7$$

A sample of 60 provided a sample mean of 7.25. The sample standard deviation is 1.052.

i) Compute the value of test statistic.
ii) At $\alpha = 0.05$, what is your conclusion?

2) Test the following hypotheses by using the χ^2 goodness of the fit.

H_0: $p_A = 0.29$, $p_B = 0.28$, $p_C = 0.25$ and $p_D = 0.18$
A sample size 300 yielded the following results.
A: 95 B: 70 C: 89 and D: 46
Use $\alpha = 0.05$ and test to see whether the proportions are as stated in H_0.

Please turn over

3) An experiment was conducted to study the effect of three fertilizers (A, B and C) on Maize yield. The data recorded (kg/plot) from the experiment are given below.

Yield (kg/plot) recorded from the experiment

	Treatments		
Replicates	A	B	C
R_1	85	71	59
R_2	75	75	64
R_3	82	73	62
R_4	76	74	69
R_5	71	69	75
R_6	85	82	67

(i) State the null hypothesis and alternate hypothesis for the above experiment.

(ii) Construct the ANOVA table for this experiment.

(iii) Interpret your result at $P = 0.05$

4) A study was conducted to investigate the relationship between farming experience and cultivated paddy land extend.

x - farming experience (years)	y - cultivated land extended(ha)
2	58
6	105
8	88
8	118
12	117
16	137
20	157
20	169
22	149
26	202

i) Develop a scatter diagram for these data.
ii) Fit the regression line.
iii) Use the estimated regression equation to predict the y when $x = 25$.
iv) Compute the coefficient of determination.
v) Calculate the correlation coefficient and comment on the relationship
vi) Test the significance of the relationship by using $\alpha = 0.05$, and comment on your result.