EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

FIRST EXAMINATION IN SCIENCE -2009/2010

SECOND SEMESTER- (April / May, 2012)

CC 106 - BIOSTATISTICS

Answer for **all** questions.   Time: **One** hour.

Statistical tables and calculators will be provided.

01. (a) Figures in following table represent the plants removal times, in minutes, of two procedures:

Procedure 1	Procedure 2
5	4
7	6
6	9
5	9
2	2

Using a suitable statistic, compare the performance of these two procedures. Give your recommendation

(b) Data on diameter (mm) and height (cm) of plants of certain species are given in following table:

Diameter (X)	Height(Y)	X^2	Y^2	XY
2	5	4	25	10
3	7	9	49	21
4	10	16	100	40
5	15	25	225	75
6	20	36	400	120

Comment about the relationship between diameter and height.

(c) Fit a regression model $Y = \beta_0 + \beta_1 X$ for the data in part (b) and check its' significance at 5% significant level.

02. (a) Active period of certain pesticide is normally distributed with mean 300 days and standard deviation of 10 days. What is the probability that the active period of a selected sample will be more than 320 days?

(b) Following are the summarized data for a sample from normal distribution which has unknown mean and variance. Under usual notation;

$n=16$; $\qquad \overline{X} = 25$; $\qquad S^2 = 25$.

Check following hypothesis at 5% significance level.

$H_0: \mu \le 22$ Vs $H_1: \mu > 22$.

(c) In a survey on the area under a crop, a total of 186 villages in a district were divided into 4 strata according to the area of the villages. From each stratum, simple random samples were selected by proportional method and the areas under crop were noted. The following is the data obtained from the survey.

Stratum	Stratum size (N_i)	Sample size (n_i)	Area under the crop
1	72	8	14,12,8,11,12,10,13,16
2	53	5	27,20,21,22,30
3	35	4	36,47,52,61
4	26	3	92,105,82

Obtain an estimator of the mean area under the crop in the district.