

Eastern University, Sri Lanka
Faculty of Agriculture
Second Year First Semester Examination 2003/2004
Introductory Statistics – CSC 2103

Answer All Questions

Time allowed: 02 Hours

1. (a) What do you understand by the term, 'Probability'?

The question, "Do you smoke?" was asked of 100 people. Results are shown in the Table.

	Yes	No
Male	19	41
Female	12	28

- i. What is the probability of randomly selected individual being a male who smokes?
- ii. What is the probability of a randomly selected individual being a male?
- iii. What is the probability of a randomly selected individual smoking?
- iv. What is the probability of a randomly selected male who does not smoke?
- v. What is the probability that randomly selected smoker is male?
- vi. What is the probability that randomly selected non-smoker is female?

(b)

- i. A total of 320 families of six children each were surveyed to find out that boys and girls are occurring with equal frequency with the results shown below.

No. of girls	6	5	4	3	2	1	0
No. of boys	0	1	2	3	4	5	6
No. of families	6	33	71	99	69	37	5

- i. Propose a null hypothesis.
- ii. Use Pascals' triangle method and find out the probability to get,
 - a. All boys
 - b. Five boys and a girl
 - c. Four boys and two girls
 - d. Three boys and three girls
 - e. At least three boys

- iii. Calculate the expected families in each combination
- iv. Calculate the deviation in each combination.
- v. Name a suitable statistical test to verify your hypothesis.
- vi. State with reasons whether you accept or reject the null hypothesis at 5% level.

2. A study was conducted to evaluate the concentration of Auxin and root elongation in grapevine cuttings. The relationship between the concentration of Auxin (μg) and the root length (mm) of grapevine cuttings are shown below:

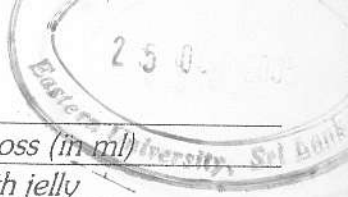
Concentration of Auxin (μg)	6	8	10	12	14	16	18	20	22	24	26	28
Root elongation (mm)	10	10	9	5	7	4	1	2	1	2	1	0

$$\sum x = 204 \quad \sum y = 52 \quad \sum xy = 606 \quad \sum x^2 = 4040 \quad \sum xy^2 = 382$$

- i. Indicate the dependent/Independent variable.
 - ii. Draw a scatter diagram.
 - iii. Calculate the coefficient of correlation and test its significance.
 - iv. Fit a regression line to the above data.
 - v. Predict the root growth at the concentration of 15 μg of Auxin.
 - vi. Comment on the relationship.
3. Write notes on the following.

- i. Characteristics of normal distribution
- ii. Least Significant Difference (LSD)
- iii. "t" test

4. An experiment was designed to measure the amounts of water (ml) leaving the upper and lower surfaces of a leaf. Sixteen leaves were detached from a cowpea plant, and their areas were measured. They were then divided into four batches of four leaves, and each batch was given one of four treatments. One batch was left untreated ('neither'), the other three batches were smeared with petroleum jelly on either their top, bottom, or both surfaces. The results are shown below:



Leaf replicate No.	Total Amount of water loss (in ml)			
	Surface covered with jelly			
	Neither	Top	Bottom	Both
1	86	41	25	13
2	108	44	35	11
3	118	40	37	13
4	79	52	26	13

$$\sum x^2 = 51669$$

$$\text{Correction factor} = 34318$$

- a. Perform a suitable statistical analysis and find out whether there is any significant difference among the treatments.
- b. Comment on your results.