

Eastern University, Sri Lanka

Second Year First Semester Examination in Agriculture 2007/2008

CSC 2103 Introductory Statistics



Answer the all questions

Time: Two hours

1.

- Define the term contingency table.
- Following table shows a random sample of leaves classified by rust infestation and field.

Contingency table for rust infestation and field

| Field | Rust | Non rust |
|-------|------|----------|
| A | 372 | 24 |
| B | 330 | 48 |

Find the expected frequencies.

Does the rust infestation vary between fields?

2. An experiment was conducted to compare five rice varieties A, B, C, D and E. The yield was recorded as follows in a completely random design.

| Variety | Yield(Kg) | | | |
|---------|-----------|-----|----|-----|
| | R1 | R2 | R3 | R4 |
| A | 5 | 4 | 4 | 4 |
| B | 3 | 3 | 4 | 3.5 |
| C | 6 | 6.5 | 7 | 6 |
| D | 8 | 7 | 7 | 7 |
| E | 4 | 4.5 | 5 | 4 |

- State the null hypothesis and alternate hypothesis for the above experiment.
- Construct the ANOVA table for this experiment.
- Interpret your result at $P=0.05$.

3. An experiment was conducted to study the effect of a certain drug in lowering heart rate in adults. The independent variable is dosage in milligrams of the drug; the dependent variable is the difference between the lowest rate following administration of the drug and a pre drug control. The following data were collected.

| X- Dosage (mg) | Y-Reduction in heart rate (beats min ⁻¹) |
|----------------|--|
| 0.5 | 10 |
| 0.75 | 8 |
| 1.0 | 12 |
| 1.25 | 12 |
| 1.5 | 14 |
| 1.75 | 12 |
| 2.0 | 16 |
| 2.25 | 18 |
| 2.5 | 17 |
| 2.75 | 20 |
| 3.0 | 18 |
| 3.25 | 20 |
| 3.5 | 21 |

- Fit the regression line.
- Calculate the correlation coefficient and comment on the relationship.
- Test the significance of the regression coefficient.

4. Height of trees which are grown in different locations is given below.

| Location | Tree height(m) | | | | | |
|----------|----------------|-----|-----|----|-----|----|
| Wood | 8 | 9.5 | 7.5 | 10 | 8.5 | 11 |
| Solitary | 7 | 8 | 7.5 | 8 | 7.5 | 6 |

- Is there significant difference in tree height grown in two different locations?
- Interpret your result at $P=0.05$.