



THE OPEN UNIVERSITY OF SRI LANKA
B.Sc./ B. Ed. DEGREE, CONTINUING EDUCATION PROGRAMME
BACHELOR OF INDUSTRIAL STUDIES PROGRAMME
OPEN BOOK TEST 2008/2009
PSU 1182/PSE 3182//PSZ 3182 – BIO STATISTICS



DURATION: ONE AND HALF HOURS

Date: 30.09.2008

4.0-0pm – 5.30pm

ANSWER ALL QUESTIONS.

Statistical Tables are provided.



1. A researcher has identified temperature, pressure and catalyst as factors affecting the yield of precipitate from a chemical reaction. He is interested in identifying the temperature, pressure level and the catalyst to be added in order to receive the highest yield. He has pre-determined two temperatures (100°C , 200°C), two pressure levels (20psi, 30psi) and two catalysts (A, B) for further study. The researcher prepared 40 samples and the following table indicates temperature, pressure and catalyst randomly used for these samples.

Temperature ($^{\circ}\text{C}$)	Pressure (psi)	Catalyst	Number of samples
100	20	A	10
100	30	A	10
200	20	B	10
200	30	B	10

- i) In relation to this study, explain the following terms.
- a) random variation
 - b) treatment
 - c) interaction
- ii) Do you agree with the design used for this study? If not, clearly describe the weaknesses of the design and explain how you would design the study. If you use the random number table, clearly explain how you use it.

2. State whether the following statements are true or false. In each case, give reasons for your answer.
- i) Randomized complete block design is suitable for collecting data to study how food habits are related to dental caries in school children.
 - ii) Cluster sampling is suitable for collecting data to study whether the attendance for day schools affects the performance at the Open Book test on the Bio Statistics course. Suppose day schools at Colombo, Kandy and Matara regional centres are conducted by three different individuals who may differ in the teaching methods used.
 - iii) Systematic sampling can produce non representative samples.
 - iv) In a homogeneous population, there is no variation between observations collected on different experimental units.
3. In a study on obesity of Sri Lankan persons in the age group of 40 to 50 years, a researcher recorded information on four variables V_1, V_2, V_3 and V_4 that are described below on 300 Sri Lankans randomly selected from the said age group.
- V_1 : body weight (in kilograms)
 - V_2 : gender
 - V_3 : whether the person is a heavy smoker, moderate smoker or non-smoker
 - V_4 : food consumption per day (in calories)
- i) Describe the population and state whether the population is finite or infinite.
 - ii) Classify the data collected in this study as qualitative or quantitative.
 - iii) Classify the data collected in this study as nominal, ordinal, interval or ratio.
 - iv) Describe the following terms in relation to this study.
 - a) experimental unit
 - b) non-sampling error

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