The Open University of Sri Lanka

B.Sc/B.Ed. DEGREE, CONTINUING EDUCATION PROGRAMME

Open Book Test (OBT) 2016/2017

Level 05 - Applied Mathematics

PCU3141/ PCE5141/ PCU1142/ PCE3142/ PSU1182– Bio Statistics

Date: - 20.05.2017	Time: 10.30 a.m. – 11.30a.m.

Instructions

- This examination is of **One hour** duration.
- Answer **All** questions.
- Each of the two questions is allocated fifty marks.
- Statistical tables are provided.

1. A researcher plans to assess the satisfaction of students about a day school conducted using multimedia in a large lecture hall. The lecture hall had 300 chairs arranged in 30 rows with 10 chairs in each row. Suppose 300 students attended the day school and the researcher sampled the students in the first three rows.

   State whether each of the following statements is true or false.

   i) The population in this study is a finite population.

   ii) The population in this study is a hypothetical population.

   iii) The population in this study is a homogeneous population.

   iv) The researcher has used a non-probability sample.

   v) If the researcher had increased the sample size, the sampling error will be reduced.

vi) Since researcher had sampled the first three rows, he has done cluster sampling with rows representing clusters.

vii) The study described here is an observational study.

viii) If the researcher had done a census, the study will not have non-sampling errors.

ix) If the researcher had sampled every tenth student as they come out from the lecture hall, the resulting sample is a systematic sample.

x) Systematic sampling can produce non-representative samples.

2. A researcher wants to estimate the number of animals infected with a disease in a farm. The farm has 2000 animals and the researcher wants to collect a simple random sample of size 100. Suppose the researcher seeks your advice on how to do the sampling.

i) Clearly explain how you advise. If you use the random number table, clearly explain how you use it.

ii) State whether each of the following statements is true or false in relation to this study.

a) Random sampling guarantees that the resulting sample is representative.

b) A researcher collected two samples each of size 100 and found that the estimates derived from the two samples have large discrepancy. The discrepancy in the estimates represents non-sampling error.

c) If the symptoms of the disease take a long time to appear and the researcher is likely to misidentify infected animals as non-infected, the resulting estimate will have a bias.

d) If the animals are fed in groups of ten and the disease gets spread through sharing food, stratified sampling is recommended over simple random sampling.

e) If the animals largely differ with respect to age, one can expect large sampling variation.