UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2013

TITLE OF PAPER	:	RESEARCH METHODS
COURSE CODE	:	ST332
TIME ALLOWED	:	2 (TWO) HOURS
REQUIRMENTS	:	NONE
INSTRUCTIONS	:	ANSWER <u>BOTH</u> QUESTIONS IN PART A AND ANY <u>THREE</u> QUESTIONS IN PART B. ALL QUESTIONS CARRY EQUAL MARKS.

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PART A: ANSWER BOTH QUESTIONS:

QUESTION ONE.   [4 x 5 = 20 marks]

For each of the following problems, three possible conclusions are given. Choose the most correct one and justify your choice:

1.1   A box contains 10000 arbitrarily numbered tickets. Two people want to estimate the average of the numbers in the box. They agree to take a sample of 100 tickets, and use the sample average as their estimate. Person A wants to draw the tickets at random without replacement and person B wants to take a simple random sample.

     (a)   Person A will get more accurate estimate.
     (b)   Person B will get more accurate estimate.
     (c)   Both will get estimate with same accuracy.

1.2   A factory manager is concerned about the daily number of absentees. A system of monitoring attendance is introduced and thereafter the number of absentees is recorded every day. Finding that the number of absentees is low, the manger concludes that the monitoring system is a success.

     (a)   The manager's conclusion is not acceptable, because the manager did not use any kind of random sampling.
     (b)   The manager's conclusion is not justified, because he ignored the absentee rate of the period before the monitoring system was introduced.
     (c)   The manager's conclusion is correct.

1.3   A survey is carried out by the Electricity Board to determine the average consumption of electricity per household in Swaziland. To draw the sample, they first divided up the population of Swaziland into 16 regional divisions. Then 5 of these divisions were selected using simple random sampling and lists of all households in these 5 divisions were prepared to be interviewed.

     (a)   This sample was drawn using simple random sampling.
     (b)   This sample was drawn using stratified random sampling.
     (c)   This sample was drawn using cluster sampling.

1.4   A number of customers of a commercial bank complain that they have to wait for a long time before getting served. The bank asked a consultant to investigate this complaint and submit a report within a month. A survey is carried out by the consultant to determine the average waiting time of a customer using a simple random sample. The consultant found that the estimated average waiting time of a customer before getting served is about 3.94 minutes. Based on the above estimate:

     (a)   The bank should increase the number of tellers.
     (b)   The bank should decrease the number of tellers.
     (c)   The bank should do neither (a) nor (b).

1.5 A researcher is studying the relationship between the two variables; the "faculty of students" and their "performance at the year-end examination". Assume that the first variable uses 1 for Science faculty, 2 for Agriculture faculty, 3 for Commerce faculty, etc. and performances are measured by the average marks of all the courses taken at the year-end examination. The researcher found a correlation coefficient of − 0.87 between these two variables. With this result:

(a) The researcher concluded that he made an error in computing correlation coefficient.

(b) The researcher concluded that those students with a low numerical code for faculty would tend to have high average marks at the year-end examination.

(c) The researcher concluded that these two variables are not suitable for computing a correlation coefficient.

QUESTION TWO.   [10 + 6 + 2 + 2 marks]

Suppose that a researcher would like to investigate the health condition of orphans aged below 10 years in the capital city, using a probability sampling. The main purpose of the study is to estimate the proportion of orphans with HIV positive. It is unlikely that a list of all these orphans in the capital city exists and so she must needs to use a complex probability sampling. Therefore, the researcher chooses five townships, excluding the commercial and industrial districts, using a simple random sampling from all existing townships as per the municipal council definition. From each of the five townships selected, she obtains a list of "blocks", a smaller unit in terms of geographical area. She uses again simple random sampling to select 10 blocks from each selected townships.

At block level, the researcher compiles, with the help of some local residences, a list of all orphans under ten years of age living in each of those selected blocks. She decided to select 10 orphans randomly from each blocks. Based on the above facts, answer the following questions:

2.1 State the following for the above study:
(a) What is the population in this study and state the size of the population (if known)?
(b) Which sampling method was used in this study?
(c) State the size of the sample (if known)?
(d) What is the parameter in this study and state its value (if known)?
(e) What is the statistic in this study and state its value (if known)?

2.2 (a) State the sampling frame(s) used in the above survey.
(b) If your answer in 2.1(b) is Simple Random Sampling, explain the suitability of the sampling method. If not, then explain why it was not suitable in this situation.

2.3 You know that the survey design excluded the commercial and industrial districts of the capital city, explain whether this exclusion have any effect on the validity of the survey results.

2.4 Suppose you are asked to do the same investigation, which sampling method will you choose? Explain your answer.

PART B: ANSWER ANY THREE QUESTIONS

QUESTION THREE.   [10 + 10 marks]

3.1   Discuss the important advantages and disadvantages of probability sampling over non-probability sampling.

3.2   Compare Personal Interviews mode over Telephone Interviews mode of data collection with respect to similarities and differences.

QUESTION FOUR.   [10 + 10 marks]

4.1   The first question most students ask is "how do I find a research problem"? There are three important sources of problems: experience, deductions from theory and related literature. Discuss how these three sources help you (as a new researcher) to find a research problem.

4.2   State and discuss the different component of research proposal.

QUESTION FIVE.   [10 + 10 marks]

5.1   Suppose you need to conduct a study as the requirement of a course. Choose a title for the required study and evaluate your research topic using all the criteria of evaluation.

5.2   Discuss some of the common faults that should be avoided in preparing a research proposal.

QUESTION SIX.   [20 marks]

Discuss the following pairs of terms:

6.1   Survey and Census
6.2   Conclusions of the Study and Recommendations of the Study
6.3   Stratified Random Sampling and Cluster Sampling
6.4   Objectives of the Problem and Significances of the problem
6.5   Population and Sample