



SCHOOL OF COMPUTING AND ENGINEERING SCIENCES

Master of Science in Information Systems Security

MST 8301: Research Methodology

Date: 23rd May 2023

Exam Duration: 2¹/₂ Hours

Instructions

- i. There are four Questions.
- ii. Answer question **ONE** and any other **TWO** Questions

Question ONE (20 Marks): Compulsory

- a. Briefly discuss the various stages involved in the research process. [4 marks]
- a. Variables are the basic units of the information studied and interpreted in research studies. Researchers carefully analyze and interpret the value(s) of each variable to make sense of how things relate to each other in a descriptive study or what has happened in an experiment. What is the difference between the dependent variable and the independent variable? [4 marks]
- b. Quality of research can be explained through the measures of validity and reliability. Describe what is meant by reliability and validity? [4 marks]
- c. A scientific research proposal provides a concise and coherent summary of a research. It sets out the central issues or questions that the researcher intends to address. It outlines the general area of study within which the research falls, referring to the current state of knowledge and any recent debates on the topic. What constitutes successful research proposal? Identify its elements in details. [8 marks]

Question TWO (15 Marks)

- a. Describe the different methods of collecting data indicating the merits and demerits of each of them. [6 marks]
- b. A descriptive research design is one of the commonly used research designs. It uses a variety of descriptive analysis techniques.

- i. Why is descriptive analysis used in research? [2 marks]
- ii. What are measures of central tendency used for in a descriptive research? [2 marks]
- iii. When would you use a median rather than a mean in descriptive research? [2 marks]
- iv. What are measures of dispersion used for? [1 mark]
- v. What information does the standard error of the mean give you when you conduct descriptive analysis? [2 marks]

Question THREE (15 Marks)

- b. When you conduct correlation analysis, the outcome could give a negative or positive value. Suppose you conducted a correlation analysis and obtained the following values -0.8 and +0.8. Is a correlation of -0.8 weaker than a correlation of +0.8? Explain. [3 marks]
- c. Statistical testing is important in research. It provides a mechanism for making quantitative decisions about a process or processes. The intent is to determine whether there is enough evidence to "reject" a conjecture or hypothesis about the process. One of the statistic obtained when conducting statistical testing is p-value. What does the p value tell you? [2 marks]
- d. Scientific research is considered to be a creative and systematic work undertaken to increase the stock of knowledge. What are the seven basic steps of the scientific method of conducting research? [3 marks]
- d. Literature review is a critical component of any scientific research. It can be seen as an overview of the previously published works on a specific topic and it thus give a theoretical base for the research and help the researcher determine the nature of the research they are conducting.
 - i. What is the significance of literature review in a scientific research? [3 marks]
 - ii. Describe the principles and procedures of review of literature. [4 marks]

Question FOUR (15 Marks)

- a. State their chief sources and point out the dangers involved in their use and the precautions necessary to use them. Illustrate with example. [4 marks]
- b. Survey research is described as the collection of information from a sample of individuals through their responses to questions. This type of research allows for a variety of methods to

recruit participants, collect data, and utilize various methods of instrumentation. Sometimes before the survey research is undertaken, it is advisable to carry-out a pilot study.

- i. Explain the purpose of pilot studies? [4 marks]
 - ii. Identify problems with the survey technique [3 marks]
- c. Research approaches are divided into qualitative, quantitative, and mixed methods, explain what are these approaches and what are research purposes that they serve? [4 marks]