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UNIVERSITY EXAMINATIONS 2023/2024

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DEGREE OF MASTERS OF
SCIENCE IN APPLIED STATISTICS, APPLIED MATHEMATICS

SMS/SMA 5225: RESEARCH METHODS

DATE: APRIL 2023

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

Diabetes is a widespread slow healing health condition that occurs when the body secretes no or insufficient insulin or does not accept it effectively. The most common type of diabetes is type II. Diabetes occurs in three forms namely; **type I diabetes** which is believed to be an auto-immune condition (your immune system mistakenly attacks and destroys the cells in your pancreas that produce insulin and the damage is permanent), **type II diabetes** which starts as insulin resistance (the body can't use insulin efficiently, which stimulates the pancreas to produce more insulin until it can no longer keep up with the demand, insulin production decreases which leads to high blood sugar), **gestational diabetes** which is due to insulin blocking hormones during pregnancy (occurs only during pregnancy). Type II diabetes accounts for almost 90% of all cases of diabetes recorded. According to World Health Organization (WHO) study from 2008, type II diabetes is a rising crisis that threatens the health sector and undermines economies. It affects adults between the age of twenty and seventy-five and many people have died as a result of it in Meru County. This could also be the consequence of rapid urbanization and lifestyle change. Age, gender, heavy smoking, alcohol intake, hypertension and family history on diabetes are the factors reported to be the risk factors of type II diabetes as per previous studies. Most of these studies, in Kenya have been done in teaching and national referral



hospitals and they have primarily concentrated on diabetes complications. Since health in Kenya is devolved, facility-based investigation is necessary to direct health policy formulation at the local governments. If a potential complication is detected early enough, there be more opportunities for education, diagnosis and referral to a specialist.

A surge in diabetes among Meru County residents has sparked speculation that there could be other factors that have exposed them to type II diabetes.

Assuming you were to carry out a study based on this write up

- i. Conceptualize the study by Formulating the title of the study and a brief problem statement (5 marks)
 - ii. Write three research objectives for your study (3marks)
 - iii. From (iii) formulate three research hypothesis (3marks)
 - iv. Describe the research design you would adopt for this study (3marks)
 - v. Specify the model you would use for the data analysis (3marks)
 - vi. Write a brief justification of the study (3marks)
 - vii. How will you enhance ethical values while carrying out this study? (2marks)
 - viii. State two possible limitation you would encounter while carrying out this study (2 marks)
- b) Many scientists have defined the term "research" with different words. In your own words and with three pointers, describe what you understand by the term "research". (6 Marks)

QUESTION TWO (20MARKS)

- a) State and distinguish the two types of research (4marks)
- b) Discuss the significance of literature review in research (5marks)
- c) i). What does it mean by reliability of a research article (2marks)
ii). Highlight the three pillars of research. (6marks)
- d) Briefly explain the best approach to use when reading a research article. (3marks)

QUESTION THREE (20 MARKS)

- a) Highlight the criteria of writing the. research reports. (4 marks)
- b) Highlight what is meant by research hypothesis and state three functions of research hypothesis. (6marks)



- c) Discuss the important of theory in scientific research (6 marks)
- d) Distinguish the inductive and deductive approaches to theory development in research study. (4marks)

QUESTION FOUR (20 MARKS)

- a) Explain the standard operating procedures on data quality managements used in research (4 marks)
- b) Highlight the significance of pilot study (4 marks)
- c) Explain the research design and discuss two functions of research design (5 marks)
- d) "Evaluation of a research article involves an assessment of its quality and validity." Discuss. (7 marks)

QUESTION FIVE. (20 MARKS)

- a) i. State the guidelines of stating research problem. (3 marks)
- ii. Highlight what is meant by delineating a research problem (2 marks)
- b) Highlight the importance of research proposal! (5 marks)
- c) Discuss the three ethical issues to be considered when carrying out research work. (6 marks)
- d) Highlight the security guidelines for your research data. (4 marks)

