



UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE (GENERAL), BACHELOR OF
EDUCATION (SCIENCE)**

BOTA 325: RESEARCH METHODS

STREAMS: Bed(Science)Bsc (General)

TIME: 2 HRS

DAY: THURSDAY [2.30 - 4.30 P.M]

DATE: 11/04/2024

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

INSTRUCTIONS: Answer **ALL** questions in section **A** and any **TWO** in section **B**

SECTION A: (40 MARKS)

QUESTION ONE

- a) Define research **(2 Marks)**
- b) Briefly explain the purposes of scientific theory **(5 Marks)**

QUESTION TWO

Differentiate the following terms **(4 Marks)**

- i. Population and sample
- ii. Qualitative research and quantitative research
- iii. Research gap and hypothesis
- iv. Nominal scale and interval scale

QUESTION THREE

Outline four determinants of scope in any research study **(4 Marks)**

QUESTION FOUR

Briefly describe any five ways in which one can arrive at identifying a research problem **(10 Marks)**

QUESTION FIVE

- a) What is plagiarism and in what ways can one avoid the pit falls of plagiarism. **(2 Marks)**
- b) Explain the importance of a transmittal letter in research. **(3 Marks)**

QUESTION SIX

Discuss the importance of literature review in academic writing **(6 Marks)**

QUESTION SEVEN

Briefly describe the qualities of a good research proposal **(4 Marks)**



SECTION B: (30 MARKS)**QUESTION EIGHT**

Use the abstract below to answer the questions that follow:

(15 Marks)

Maize (*Zea mays*) is one of the most important crops in Kenya and in the world serving both as staple food and cash crop to millions of people. Its' production is threatened and attributed to both abiotic and biotic. Southern leaf rust caused by *Puccinia polysora* is the most destructive foliar disease in the maize growing regions, destroying the photosynthetic tissues leading to more than 50% yield losses in susceptible host maize genotypes. Several strategies including use of fungicides have been advanced to combat southern leaf rust (SLR) but with little success owing to the fact that southern leaf rust has many different pathogenic races causing pathogenicity in susceptible host maize genotypes. However, development of resistant maize varieties is the ideal strategy to combat *P. polysora*. Therefore, this study will be conducted to; (i) determine the incidence and severity of southern leaf rust (ii) evaluate the response of ten maize inbred lines to *Puccinia polysora* for two seasons in (2021) under natural infestation and identify resistance lines and (iii) examine associations between southern leaf rust parameters and weather variables in Maseno University research farm. Field trials will be conducted following a randomized complete block design (RCBD) and each block consisting of single rows 3m long randomly replicated three times to screen 10 maize inbred lines from Maseno University maize breeding program; Fwhite, F6-20R, EX614Prw, EXbear DC, Recipro, EX614 green DC, EX44142-2, EX614p-(RPP), EX614DC Purple and CML 389 will be used as a resistance check. Disease severity will be rated on a 1-5 point scale from the flowering stage to physiological maturity stage. Final disease rating (FDR), Mean disease rating (MDR), Area under disease progress curve (AUDPC) will be calculated. Data collected will be subjected to Analysis of Variance (ANOVA) at 5% level of significance using Genstat and means will be separated using the Least Significant Differences (LSD). The project expects to determine the incidence and severity of southern leaf rust in Maseno university research farm and the response of selected maize inbred lines to southern leaf rust. From the study it is hoped that scientific community, the government of Kenya and farming community, especially small scale maize farmers, will be among the beneficiaries. The findings will form the basis for the establishment, planning, policy making and monitoring of effective disease management strategies and be useful for further research on southern leaf rust caused by *P. polysora*.

- a. Identify a research topic
- b. Write a one paragraph problem statement
- c. Write four specific objectives and hypotheses
- d. Outline the measurement scales used in the operationalization of the variables



QUESTION NINE

You have been sponsored to undertake research on malaria in the western and coastal part of Kenya.

- a. Discuss **five** logistical issues which you would consider **(5 Marks)**
- b. Discuss **five** ethical considerations that you would bear in mind **(10 Marks)**

QUESTION TEN

Describe the following parts of a research proposal

- i. Introduction
- ii. Literature review
- iii. Methodology
- iv. Time schedule
- v. Budget **(15 Marks)**

