JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN MICROBIOLOGY

1st YEAR 1st SEMESTER 2018/2019 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE:	**SBT 805**
COURSE TITLE:	**SPECIAL TOPICS**
EXAM VENUE:	**STREAM: (MSC)**
DATE:	**EXAM SESSION:**
TIME: 2 HOURS	

Instructions:

1. **Answer ALL questions in Section A and Any two questions in Section B**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE (Compulsory) (30 MARKS)

a) State the significance of scientific research in providing solutions to human problems (3 Marks)

b) Distinguish between correlational and survey research stating the pros and cons of each type (3 Marks)

c) Explain important features of the following components of a proposal

(i) Problem Statement (3 Marks)

(ii) Literature Review (3 Marks)

(iii) Materials and methods (3 Marks)

d) State the significance of a working research hypothesis (2 Marks)

e) Explain the following sampling designs used during data collection

(i) Stratified sampling (2 Marks)

(ii) Purposive sampling (2 Marks)

f) Masters students at JOOUST intend to write a fundable research proposal. Explain six possible sources of their research idea (3 Marks)

g) Use examples to explain RCBD and Latin square experimental designs (3 Marks)

h) Explain different methods of controlling confounding variables (3 Marks)

QUESTION TWO (15 MARKS)

a) Describe the key features of a good research problem (7 Marks)

b) Explain the following types of research hypotheses

i) Associative hypothesis (2 Marks)

ii) Non-directional hypothesis (2 Marks)

iii) Null hypothesis (2 Marks)

iv) Causal hypothesis (2 Marks)

QUESTION THREE (15 MARKS)

a) Discuss the methods of data management in scientific research (8 Marks)

b) Use relevant examples to explain the following types of variables

i) Controlled variables (3 marks)

ii) Independent variables (4 marks)

QUESTION THREE (15 MARKS)

a) Discuss any four sources of information during literature review (8 marks)

b) Outline important features of the APA system of citation of resources obtained from literature (7 marks)

QUESTION FOUR (15 MARKS)

a) Explain key features of the following experimental designs

i) Completely Randomized Design (3 Marks)

ii) Randomized Block Design (3 marks)

iii) Latin square Design (3 marks)

b) Discuss the following methods of data collection

i) Field observations (3 marks)

ii) Questionnaires (3 marks)

QUESTION FIVE (15 MARKS)

a) You have information that the vegetables sold at your local market may be unsafe for human consumption due to the presence of pathogenic microorganisms. A research institution has advertised for a call for submission of proposals to attempt to mitigate this problem. Develop two objectives and hypotheses in this research area and write a ¾-page Problem Statement that you would submit to the research institution. (10 marks).

b) Comment on the following types of bias in research

i) Selection bias (3 marks)

ii) Measurement bias (2 marks)