



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**UNIVERSITY EXAMINATION FOR THE DEGREE IN SCIENCE IN RENEWABLE  
ENERGY TECHNOLOGY AND MANAGEMENT**

**3<sup>RD</sup> YEAR 1<sup>ST</sup> SEMESTER 2024/2025 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: TEB 1315**

**COURSE TITLE: RESEARCH METHODS**

**EXAM VENUE:**

**STREAM: BSc. REN ENGY TEC & MGT**

**DATE: 9 /1/2025**

**EXAM SESSION:14-16.00 HRS**

**DURATION: 2 HOURS**

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**Instructions**

- 1. Attempt any FOUR (4) questions**
- 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.**

1. What is:
- (a) The purpose of research? (4 Marks)
  - (b) The difference between science and art? (8 Marks)
  - (c) Qualitative research? (4 Marks)
  - (d) Quantitative research? (4 Marks)
  - (e) The difference between basic and applied research? (5 Marks)
2. (a) Using a flow chart describe the steps in research process. (9 Marks)
- (b) Outline the following terms as applied to research: (16 marks)
- i. Population
  - ii. Sampling frame
  - iii. Sampling design
  - iv. Statistics and parameters
  - v. Sampling error
  - vi. Precision
  - vii. Confidence level
  - viii. Sampling distribution
3. (a) Define the following terms as applied research:
- i. Measure of central tendency
  - ii. Measure of dispersion
- (b) Calculate the arithmetic mean for the following population:  
 $5.47 \times 10^{-4} \text{ cm}$ ,  $6.831 \times 10^{-8} \text{ cm}$ ,  $2.1211 \times 10^{-5} \text{ cm}$  (6 Marks)
- (c) A car dealership has set a goal for its 15 salespeople of selling 150 new cars in an eight-week period. In the first six weeks of this period, an average  $\bar{x} = 19.5$  cars were sold each week. How many cars must be sold in the remaining two weeks to achieve the 150 – car goal? (6 Marks)
- (d) Using both the odd-even rules, find the median for this sample: 12, 12, 14, 17, 19, 21. (4 Marks)
- (e) For the population 9.1, 8.7, 9.0, 9.2, calculate the population standard deviation. (4 Marks)
- (f) What is the significance of proper data storage in research project executions? (5 Marks)
- (g) (a) What is the purpose of a research proposal? (6 Marks)  
(b) What are the elements of a research proposal? (6 Marks)  
(c) What is the significance of audience in research proposal development? (5 Marks)  
(d) What is the significance of literature survey in research proposal development? (4 Marks)  
(e) What is an abstract? (4 Marks)
5. (a) What are the elements of a research report? (6 Marks)
- (b) Outline two types of research project reports. (6 Marks)
- (c) Outline the significance of oral presentation of research findings. (4 Marks)
- (d) What is:
- (i) Ethics?
  - (ii) Morals (6 Marks)

- (e) What is the significance of ethics in research? (3 Marks)
- (h) (a) What is:
- i. Theory?
  - ii. Paradigm? ( 6 Marks)
- (b) What is the difference between conceptual and empirical research? (6 Marks)
- (c) What is the difference between descriptive and analytical research? (6 Marks)
- (d) For the following populations, indicate whether they are finite or infinite physical populations or measurement populations:
- i. the current ages of all living women who have swum in Lake Victoria,
  - ii. the number of trials it takes in an experiment for a Kaloleni rat to learn a specific maze under specific conditions,
  - iii. all the body cells in a living 20-year-old man,
  - iv. all chocolate cakes baked from a specific recipe,
  - v. the body weights of all current and past citizens of the Kisumu County

100% JUST OBSERVES ZERO TOLERANCE TO EXAMS CHEATING