

EGERTON

UNIVERSITY



UNIVERSITY EXAMINATIONS

REGULAR -NJORO CAMPUS

SECOND SEMESTER, 2023/2024 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
NATURAL RESOURCE MANAGEMENT**

NARE 352/NARE 459: ECOLOGICAL SURVEYS AND TECHNIQUES

STREAM: BSe (NARE, DLRM, TOHM & ENSCI) (Y352)

TIME: 3 HRS

EXAMINATION SESSION: APRIL

YEAR: 2024

INSTRUCTIONS:

- (i) Answer ALL questions in Section A and any two questions in section B
- (ii) Do not write on the question paper
- (iii) Answer questions clearly and concisely.

SECTION A (40 MARKS)

Question One

- a) Describe the following terms commonly used in ecological surveys and techniques:
 - i). Reverse planning (2 Marks)
 - ii). Population indices (2 Marks)
 - iii). Nested quadrats (2 Marks)
- b) Distinguish between the following:
 - i). Cluster and multilevel sampling (3 Marks)
 - ii). Qualitative and quantitative data (3 Marks)

Question Two

Briefly describe four types of graphs that can be used to present ecological data. (8 Marks)

Question Three

List any three habitat elements associated with each of the following habitat features:

- i). Vegetation-derived features (3 Marks)
- ii). Aquatic physical features (3 Marks)

Question Four

- a) Outline the key information to gather/record when counting wild animals. (6 Marks)
- b) A researcher captures 200 mice, marks and releases them. Two months later, the researcher recaptures 150 mice, of which 80 have marks.
 - i). Calculate the population size of mice in this ecosystem (4 Marks)
Formula: $Y = (M[n+1]/(m+1))$
 - ii). Outline any four assumptions of the technique used above. (4 Marks)

SECTION B (30 MARKS)

Question Five

Discuss the approaches used to estimate grass biomass. (15 Marks)

Question Six

The gold standard for the methods section of an ecological assessment/monitoring report is that a reader should be able to use it to repeat exactly what was done and produce comparable results.

Discuss the key elements of this section. (15 Marks)

Question Seven

- a) Discuss the methods used to determine plant species composition. (10 Marks)
- b) The table below shows a pilot study data on the proportion of a tree species across twelve plots.

Pbt ID	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Proportion	0.22	0.31	0.28	0.36	0.15	0.16	0.43	0.32	0.25	0.26	0.35	0.31

Approximate the ideal sample size for the main study, assuming a PRP of 15. (5 Marks)

Formula: