



UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

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

CHEM 326: RESEARCH METHODS AND SEMINARS I

STREAM: R

TIME: 2 HRS

DAY: WEDNESDAY [8.30AM -10.30AM] DATE: 10/04/2024

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

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INSTRUCTIONS: ATTEMPT ALL QUESTIONS**QUESTION ONE (30 MARKS)**

- a) Define the following terms
- | | |
|------------------------|-----------|
| i. Research | (2 Marks) |
| ii. Dependent variable | (2 Marks) |
| iii. Hypothesis | (2 Marks) |
| iv. Experiment | (2 Marks) |
| v. Sampling | (2 Marks) |
- b) Use an example to describe the following expressions as used in research (9 Marks)
- | | |
|------------------------|--|
| i. Problem statement | |
| ii. Justification | |
| iii. Research question | |
- c) Explain any four sampling methods (6 Marks)
- d) In a research explain what you understand by the term ‘Control group’ and give an example (2 Marks)
- e) What is scientific research method? List the steps involved. (3 Marks)

QUESTION TWO (20 MARKS)

- a) Classify each statement as a law, an experiment, a theory, a hypothesis, a qualitative or quantitative observation.
- | | |
|--|----------|
| i) Ice always floats in liquid water | (1 Mark) |
| ii) Hot air is always denser than cold air, probably because the components of hot air are moving more rapidly” | (1 Mark) |
| iii) Measured amounts of acid were added to caffeine tablet to see whether it really “consumes 42 times its weight in excess stomach acid” | (1 Mark) |
| iv) Limestone is relatively insoluble in water, but dissolves readily in dilute acid with the evolution of a gas | (1 Mark) |
- b) Describe a format of laboratory report and explain its contents in a summarized manner (6 Marks)
- c) Discuss **four** the benefit of research in Sciences (6 Marks)
- d) Discuss the difference between structured and unstructured interviews in relation to data collection (4 Marks)



QUESTION THREE (20 MARKS)

- a) Explain the purpose of research reports **(3 Marks)**
- b) Distinguish between inductive and deductive research giving examples where it is applied **(3 Marks)**
- c) Describe in details what you understand by the following sampling methods:
- i) Probability sampling **(3 Marks)**
 - ii) Non-probability sampling **(1 Mark)**
- d) Discuss three advantages and three disadvantages of an online search for literature **(6 Marks)**
- e) With clear examples, differentiate between an observational study and an experimental study **(4 Marks)**

