"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF PUBLIC HEALTH AND NURSING

NSNS 401: INTRODUCTION TO EPIDEMIOLOGY, BIOSTATISTICS AND HEALTH INFORMATICS

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2025

LECTURER: MR. E. CHIKAKA

DURATION: 3 HOURS

Newly diagnosed cases in that year.

(a) Calculate the **prevalence** of diabetes.

(b) Calculate the **incidence** of diabetes.

QUESTION 4

A village has 2,000 live births in 2024. Of these, 40 infants die before reaching 1 year of age. Calculate the **infant mortality rate per 1,000 live births.**

QUESTION 5

Differentiate between **randomized controlled trial (RCT)** and **cross-sectional study** (two differences).

QUESTION 6

State and explain the use of two **measures of dispersion** in statistics.

QUESTION 7

List four **Bradford Hill criteria** for establishing causality.

QUESTION 8

Mention any four **characteristics of a good public health surveillance system.**

Section B (60 Marks) (Answer ANY THREE questions. Each question carries 20 marks.)

QUESTION 1 – EPIDEMIOLOGY

    (a) Explain the **chain of infection**, clearly describing each link and how it can be broken (10 marks).

    (b) Discuss the **different patterns of epidemic occurrence**, giving an example for each (10 marks).

Question 2 – Study Designs & Measures of Association

(a) Describe the design, strengths, and limitations of a **case-control study** (10 marks).

(b) A case-control study investigated the relationship between alcohol consumption and road traffic accidents. Out of 300 accident cases, 180 had consumed alcohol, while among 400 controls, 100 had consumed alcohol.

Construct a 2×2 table and Calculate the **Odds Ratio (OR)** and interpret it (10 marks).

Question 3 – Biostatistics

(a) Discuss the **role of biostatistics in epidemiology and public health research**, giving at least three examples (10 marks).

(b) With the aid of examples, explain the following descriptive statistical tools: Histogram, Boxplot and Scatterplot (10 marks).

Question 4 – Health Informatics

(a) Define **Health Information Systems (HIS)** and describe three key characteristics of an effective HIS (10 marks).

(b) Discuss the **benefits and challenges of using Information and Communication Technology (ICT) in health care**, particularly in resource-limited settings (10 marks).