KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF THE
DEGREE OF BACHELOR OF SCIENCE IN PUBLIC HEALTH
SECOND SEMESTER 2022/2023
[MAY-AUGUST, 2023]**

PHES 408: APPLIED EPIDEMIOLOGY

STREAM: Y4S2   **TIME: 2 HOURS**

DAY: MONDAY, 9:00 – 12:00 PM   **DATE: 01/08/2023**

INSTRUCTIONS
1. *Do not write anything on this question paper.*
2. *Answer ALL questions in Section A; In Section B, answer question ONE (compulsory) and any other ONE question*

SECTION A (40 MARKS)

QUESTION 1
   a) Describe the design of a case control study including selection of cases and controls   (4 marks)
   b) Highlight three potential biases in a case control study   (3marks)
   c) Give an appropriate measure of association for a case-control study
                                                                        (1 mark)

QUESTION 2
   a) What is the major reason for random assignment in a clinical trial?
                                                                        (1 mark)
   b) Explain the purpose for double blinding or double masking a study
                                                                        (1 mark)

QUESTION 3
   a) Identify three advantages of a prospective cohort study compared to case-control study
                                                                        (3 marks)
   b) Explain two potential biases in cohort studies   (2 marks)

QUESTION 4
a. Differentiate between necessary cause and sufficient cause as used in describing causality (2 marks)
b. A cohort study conducted in Nakuru examined the risk of smoking in developing cardiovascular disease. The relative risk of developing cardiovascular disease was 2.0 comparing smokers with non-smokers. Briefly explain 3 plausible reasons for this association before possibly considering a causal association. (3marks)

QUESTION 5
a. Explain the meaning of confounding (2 marks)
b. Describe how confounders affect associations (2 marks)
c. Explain how confounding can be controlled
   i. in the design stage (2 marks)
   ii. during data analysis (2 marks)

QUESTION 6
a. What is effect modification? (2 marks)
b. Explain the difference between effect modification and confounding (2 marks)

QUESTION 7
a. You have been assigned the role of designing a surveillance system for the healthcare system in your county. What main principles should the reporting system adopt when selecting diseases to be included in surveillance? (3marks)
b. Briefly describe three uses of surveillance in epidemiologic practice (3 marks)
c. Highlight two possible sources of surveillance data for your system (2 marks)

SECTION B (30 MARKS)

QUESTION 1
The table below is a summary of the findings in a study which investigated the association between history of sexual abuse and suicide attempt in a certain population (population X).

Table of suicide attempt and history of sexual abuse for population X.

History of sexual abuse	Suicide attempted	
	YES	NO
YES	14	9
NO	49	149

    i.   Calculate the risk of attempting suicide among individuals with history of sexual abuse in population X.   (2 marks)

    ii.   What is the risk of attempting suicide among individuals without history of sexual abuse in the same population?   (2 marks)

    iii.   What is Relative Risk (RR) of suicide attempt from question (i.) and (ii.) above? Explain the meaning of the value obtained

                       (3 marks)

    iv.   Calculate the risk which (attributable risk for suicide) which can be attributed to prior history of sexual exposure. Explain the meaning of the value obtained

                       (4 marks)

    v.   What is the implication of attributable risk in Public Health as opposed to incidence measures   (2 marks)

    vi.   Calculate the Odds ratio for sexual abuse in Population X

                       (2 marks)

    vii.   What is the possible explanation for the difference between the Odds Ratio (OR) and Relative Risk (RR) for population X.

                       (2 marks)

    viii.   Which study design would you use to investigate the association between history of sexual abuse and suicide in the mentioned population. Justify your answer.

                       (3 marks)

QUESTION 2

Discuss any five criteria in Sir Austin Bradford Hill's Guidelines for assessing causation in epidemiological studies.

                       (10 marks)

QUESTION 3

The tables below show hypothetical data for the relationship between depression and gender (stratified by location)

Nairobi county	Gender		
Depression	Female	Male	Total
Yes	22	10	32
No	78	90	168
Total	100	100	200

Kisumu county	Gender		
Depression	Female	Male	Total
Yes	85	70	155
No	15	30	45
Total	100	100	200

i. Calculate the odds ratio For Nairobi county (2 marks)
ii. Calculate the odds ratio For Kisumu county (2 marks)
iii. Use the Mantel Haenszel procedure to compute the overall (common) odds ratio for Nairobi and Kisumu counties

(4 marks)
iv. State two conditions which must be met before applying the mantel Haenszel method for estimation of common odds ratio

(2 marks)