



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF HEALTH SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
PUBLIC HEALTH/COMMUNITY HEALTH AND DEVELOPMENT
1ST YEAR 1ST SEMESTER 2024/2025 ACADEMIC YEAR
MAIN/KISUMU CAMPUS

COURSE CODE: HCB 1208

COURSE TITLE: PRINCIPLES OF EPIDEMIOLOGY

EXAM VENUE: STREAM: BSc Public/ Comm. Hlth & Dev

DATE: EXAM SESSION:

TIME: 2.00 HOURS

Instructions:

- 1. Answer all the questions in Section A and 2 questions in Section B.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A: ANSWER ALL THE QUESTIONS IN THIS SECTION (30 MKS)

1. Enumerate the contributions of these two figures to the field of Epidemiology:
 - a) John Snow (1 mk)
 - b) Edward Jenner (1 mk)
2. Iceberg concept of disease (3 mks)
3. Briefly discuss the natural history of malaria (3 mks)
4. State SIX agent characteristics that influence disease patterns (3 mks)
5. The following data regarding alcohol drinking status among persons in Kilifi County were reported for 2023:

	All persons 18 years of age and older	Current regular alcoholic beverage drinkers
Male	104,919	59,300
Female	112,855	44,373

- a) State the sex ratio of male to female regular alcoholic beverage drinkers? (1 mark)
- b) What proportion (percent) of regular alcoholic drinkers are women? (1 mark)
- c) What is the prevalence per 1,000 of regular alcoholic beverage drinking among:
 - i) Men only (1 mark)
 - ii) Women only (1 mark)
6. Distinguish between;
 - a) Case control and cohort studies in epidemiology (2 mks)
 - b) Nosocomial infections and opportunistic infections (2 mks)
 - c) Airborne transmission and direct droplet transmission (2 mks)
 - d) Susceptible host and Reservoir (2 mks)
7. About 500 people complained of inflammation and fever, of which 400 reported wasp bites. Among the same number that served as controls, 200 still reported bites without symptoms and fever. Estimate the relative risk and odds ratio (4 mks)
8. State SIX agent characteristics that influence disease patterns (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION

1. a) Discuss sources of bias in epidemiology and how to control for each (10 mks)

b) A researcher follows 200 women who exercise regularly and 300 women who do not exercise regularly. After 30 years of follow-up, 20 of the women in the exercise group and 30 women in the non-exercise group are diagnosed with osteoporosis.
 - i) Draw the 2×2 contingency table for the data (2 marks)
 - ii) Compute the prevalence of osteoporosis for the whole group for the 30 years period (2 mks)

- iii) Estimate the risk ratio and odds ratio for developing osteoporosis between the two groups and interpret the results. (5 mks)
- iv) Briefly explain why the odds ratio is most commonly used as compared to the relative risk (1 mk)
- 2. a) Students of JOOUST were screened for human papilloma virus (HPV) at the University of Minnesota Laboratories. Out of the 1200 that were screened for HPV, 400 tested negatives out of which 120 were indeed infected. Further analysis on the positive samples indicated that 160 students were not infected. Based on the above information:
 - (i) Construct a 2x2 table showing the above information: (2 mks)
 - (ii) Calculate the prevalence of Human papilloma virus, sensitivity and specificity of the test. (3 mks)
 - (iii) Calculate the positive and negative predictive values of the test. (2 mks)
 - (iv) Discuss on the impact of the false positives and false negatives in public health and clinical settings (3 mks)
- b) Discuss the benefits of randomized control trial study design (10 mks)
- 3. a) Discuss on FIVE modes of intervention at the secondary level of disease prevention (10 mks)
- b) A class of 200 public health students attended a luncheon at a hotel in Bondo town. Fifty of the students later developed food poisoning (botulism) from clostridium botulinum. Each of the students at the luncheon had 2 roommates at the university. Upon returning to the university, the infection spread to 25 of the room mates. Using this information, answer the following
 - i) What type of outbreak is described above? (1 mk)
 - ii) Calculate the primary attack rate of botulism (2 mks)
 - iii) Calculate the secondary attack rate of botulism (2 mks)
 - iv) Briefly discuss the relevance of the second attack rate in epidemiology (5 mks)
- 4. a) Discuss the steps utilized when conducting outbreak investigation. (10 mks)
- b) Discuss on TWO main analytic methods used in epidemiological studies (10 mks)

