



**MACHAKOS UNIVERSITY**  
**University Examinations for 2018/2019 Academic Year**  
**SCHOOL OF HEALTH SCIENCES**  
**DEPARTMENT OF PUBLIC AND COMMUNITY HEALTH**  
**FOURTH YEAR SECOND SEMESTER EXAMINATION**  
**FOR BACHELOR OF SCIENCE IN POPULATION HEALTH.**  
**HEH 400: APPLIED EPIDEMIOLOGY**

**DATE: 8/5/2019**

**TIME: 8:30 – 10:30 AM**

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**INSTRUCTIONS:**

**SECTION A (COMPULSORY)**

- **This section has one question**
- **The question is compulsory**
- **The question is 30 marks**

**QUESTION ONE (30 MARKS)**

- a) Distinguish between observational and experimental epidemiological study designs (3 marks)
- b) In an outbreak of tuberculosis among prison inmates in Naivasha in 2015, 28 of 157 inmates residing in dormitory A developed tuberculosis, compared with 4 of 137 inmates residing in dormitory B, Using a two-by-two table. Calculate the risk ratio. (3 marks)
- c) Explain the concept of confounding and its occurrence in epidemiology (3 marks)
- d) Systemic errors contribute to bias in epidemiology. Explain (3 marks)
- e) Explain the limitations of the epidemiological triad (3 marks)
- f) Define disease surveillance and explain two (2) characteristics. (3 marks)
- g) Describe the principal methods used in analyzing data in investigation of disease outbreaks (3 marks)
- h) Briefly discuss food safety as a disease control strategy (3 marks)
- i) Outline the three (3) main elements of informed consent (3 marks)
- j) Discuss application of Mantel-Haenszel test in epidemiology (3 marks)

## **SECTION B:**

- **This section has four (4) questions**
- **Answer any two (2) questions**
- **Each question is 20 marks)**

### **QUESTION TWO (20 MARKS)**

- a) Discuss application of three (3) types of interventional studies (10 marks)
- b) Explain the limitations of cohort studies (10 marks)

### **QUESTION THREE (20 MARKS)**

- a) Explain the various measures of association and their application in epidemiology (10 marks)
- b) Development of appropriate disease control strategies is important. Discuss. (10 marks)

### **QUESTION FOUR (20 MARKS)**

- a) Explain the factors that contribute to lower life expectancy in Kenya compared to developed countries from an epidemiological perspective. (10 marks)
- b) Discuss epidemic patterns classifications in disease spread (10 marks)

### **QUESTION FIVE (20 MARKS)**

- a) Explain key ethical and professional issues in epidemiology (10 marks)
- b) Determine the following for Bela Health Centre based on Table 1: -
- i) Crude mortality rate (2 marks)
  - ii) Infant mortality rates (2 marks)
  - iii) Prevalence of Malaria (2 marks)
  - iv) Incidence rate of malaria (2 marks)
  - v) Case fatality rate for Malaria (2 marks)

**Table 1:** Morbidity and mortality data of Bela Health Centre-2016

Total population	Live births	Deaths of children 0-59 months, 2016	Deaths of children 0-12 months 2016	Total deaths 2016	New malaria cases 2016	Total malaria cases 2016	Death from malaria 2016
600,000	12,000	1200	600	3000	6000	18000	150