AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF HEALTH SYSTEMS MANAGEMENT AND DEVELOPMENT

BACHELOR OF SCIENCE IN HEALTH SYSTEMS MANAGEMENT AND DEVELOPMENT

END OF SEMESTER EXAMINATION (MAY-AUGUST 2024)

UNIT CODE: HMD 131 **UNIT NAME: EPIDEMIOLOGY AND DEMOGRAPHY**

DATE: **AUGUST 2024**

TIME: Two Hours **Start:** **Finish:**

INSTRUCTIONS

1. This exam is marked out of 70 marks
2. This Examination comprises TWO Sections
   Section A: Compulsory Question (30 marks)
   Section B: Long Answer Questions (40 marks)

SECTION A: COMPULSORY QUESTION **(30 MARKS)**

QUESTION 1

i. a) Define epidemiology and describe its main components. (5 Marks)
   b) Explain the importance of epidemiology in the health system. (5 marks)

ii. Describe the components, measures, and determinants of population dynamics in demography. (12 marks)

iii. Giving a reason in each case, identify the type of Epidemiological study described below: (8 Marks)

   a) In 2002, 400 Subjects residents of Kwale were recruited in an environmental pollution study. The death rates were compared to those of the general population after every 5 years. In the year 2021, investigators determined and compared the death rate and prevalence of illness in both groups.
   b) In the year 2000, 19500 patients with colorectal cancer were recruited into a study. A new treatment was given to 645 patients while the remaining continued with the current treatment drug. The monthly survival was charted from the year 2000-2022.
   c) Children were enrolled as study subjects in a health maintenance organization. At 18 months, each child was randomly given one of two types of vaccine against Haemophilus influenzae. Parents were asked to record any side effects on a card, and mail it back after one weeks.
   d) A study recruited a sample of 30 adults with Diabetes type 2 from a certain community, and one healthy friend of each. All subjects were asked about their physical activity schedule.

SECTION B: ANSWERS ANY TWO QUESTIONS **(40 MARKS)**

QUESTION 2 **(20 MARKS)**

i. What are the main objectives of disease prevention and describe the FOUR (4) levels of prevention (6 marks)

ii. Discuss the main objectives of disease control (4 marks)

iii. With reasons, describe the methods you would use to eliminate any THREE (3) reservoirs of infection (6 marks)

iv. Describe ways of controlling any FOUR (4) modes of transmission (4 marks)

QUESTION 3 **(20 MARKS)**

i. Explain the role of disease surveillance and surveillance systems in epidemiology and with relevant examples, discuss their importance for public health decision-making and planning. (10 Marks)

ii. Explain confounding and describe ways of controlling it (6 marks)

iii. Explain the concept of causal inference in epidemiology and its relevance for disease prevention. (4 marks)

QUESTION 4 **(20 MARKS)**

a) Discuss any FIVE (5) measures of disease frequency covered in the course, including their definitions, calculations, and applications in epidemiology (10 Marks)

b) In the mid-1800, Kenya had 2 Million infants (midpoint population), 100,000 of them developed Malaria. There were 10,000 deaths in one year. Of those 10,000 deaths, 2000 died from Malaria. Compute the following measures (k=1000). (10 Marks)

i. The annual mortality rate?
ii. The annual mortality rate from Malaria?
iii. The case fatality rate from Malaria?
iv. The proportion of deaths from Malaria?
v. The annual prevalence of Malaria?