JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF HEALTH SCIENCES

UNIVERSITY EXAMINATION FOR THIRD YEAR SEMESTER ONE DEGREE IN COMMUNITY HEALTH AND DEVELOPMENT

MAIN

COURSE CODE: HPD 3223

TITLE: DISEASE SURVEILLANCE AND OUT-BREAK INVESTIGATION

EXAM VENUE:

DATE: 17/4/19

TIME: 2.00 HOURS **EXAM SESSION: 3.00 – 5.00PM**

Instructions:

1. **Answer all the questions in Section A and ANY other 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 Questions in this section 30 MARKS

1.
   a. In a few sentences and a diagram to illustrate the relationship between the prevalence rate and incidence rate giving examples [1.5 marks]

   b. A study starts with 5,000 people. Of these, 125 have the disease in question. What is the prevalence rate of disease per 1000 people? (Show your working and, in plain terms as you interprets the results to a layperson). [1.5 marks]

2. a. Briefly differentiate Screening from Diagnosis in epidemiology [1.5 marks]
   b. Write brief notes on the three Key characteristics of a disease that would make the disease appropriate/ suitable for screening [1.5 marks]

3. An Epidemic curve or Epi curve is a simple visual display graph of the outbreak's magnitude and time trend. As a basic investigative tool, name at least three ways of how it can be informative during an outbreak investigation [3 marks]

4. a. Differentiate between Primary Case and Index Case in during out-break investigation [1.5 marks]
   b. Differentiate between signs and symptoms during case definition giving example [1.5 marks]

5. Define case definition during an outbreak investigation as you state the THREE commonly used categorization with living example of an out-break [3 marks]

6. Briefly define line listing during out-break investigation as you list at least 4 type of data that regardless of the disease you are investigating, you should be collected about every person affected [3 marks]

7. With examples, distinguish between a cluster, an epidemic and endemic of a disease [3 marks]
8. Briefly distinguish between active surveillance, Sentinel surveillance and passive surveillance as you give one limitation of each accordingly [3 marks]

9. Write brief notes giving living example in each of the following biases observe during prevention interventions; [3 marks]

   a) Volunteer (or self-selection) bias
   b) Lead-time bias
   c) length-time bias

10. You are called to help investigate a cluster of 17 men who developed leukemia in a community. Some of them worked as electrical repair men, and others were ham radio operators. Which study design would you choose to investigate a possible association between exposure to electromagnetic fields and leukemia? Please give reasons for stating that design [3 marks]

Instruction: This section has four (4) essay questions (You are required to answer 2 Questions): <u>Question ONE is mandatory to all,</u> then you can choose any 1 more from 2, 3 and 4 questions

1. CDC investigators have developed an HIV antibody test with 99.9% sensitivity and 99.5% specificity. You are required to determine the HIV prevalence using this new rapid test in a population of 10, 000 where the true prevalence is ascertained as 10%.
   a. Draw a 2 by 2 table to illustrate the formulae for calculating the following; [6 marks]

      i. Sensitivity
      ii. Specificity
      iii. Positive Predictive Values (PPV)
      iv. Positive Predictive Values (PPV)

   b. By showing your working, how many people will this new test label as; [6 marks]

i. True positive	ii. True negative
iii. False positive	iv. False negative

   c. In a diagnostic test, we say **a very sensitive test helps rule out disease (when the result is negative). Sensitivity rule out or "Snout".** In one clear sentence and explain this in a plain language as you give relevant example what this this statement means to a layman [4 marks]
   d. In a diagnostic test, we say a **very specific test rules in disease with a high degree of confidence Specificity rule in or "Spin".** In one clear sentence and explain this in a plain language as you give relevant example what this this statement means to a layman [4 marks]

2.
   a. Define public health surveillance exhaustively as you give an example of any disease surveillance system you know of? giving am example of one [2 marks]

   b. Briefly explain the FOUR major categorization of priority diseases, condition and event for the Integrated Disease Surveillance Reporting (IDSR) in Kenya [6 marks]

   c. Several qualities or attributes can be used to evaluate an effective public health surveillance, described at least **Eight** attributes which can affect the operation and usefulness of a surveillance system that need to be assessed [12 marks]

3.
   a. Define notifiable diseases giving **Three** example of these in Kenya [4 marks]
   b. Describe the **Four** main limitations that sometimes compromise the usefulness of a public health surveillance systems [8 marks]
   c. As a public health practitioner with knowledge of limitations of reporting systems, suggest at least **Four** steps which could be taken in by a surveillance health department to improve reporting [8 marks]

4.
   a. How are potential outbreaks detected normally [2 marks]
   b. Briefly explain **Four reasons** why we may need to investigate a possible outbreaks [4 marks]
   c. Outline systematically as you briefly describe each step of how you would implement an out-break investigation as chief Surveillance officer during an outbreak [14 marks]