UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER- DECEMBER 2014

TITLE OF PAPER	: FUNDAMENTALS OF EPIDEMIOLOGY
COURSE CODE	: EHM 203
TIME	: 2 HOURS
MARKS	: 100

INSTRUCTIONS

: ANSWER **QUESTION 1** AND ANY FOUR QUESTIONS

: EACH QUESTION IS 20 MARKS

: NO FORM OF PAPER SHOULD BE BROUGHT INTO NOR TAKEN OUT OF THE EXAMINATION ROOM

: BEGIN THE ANSWER TO EACH QUESTION ON A SEPARATE SHEET OF PAPER

: CALCULATORS MAY BE USED BUT THEY MUST BE OF THE SILENT TYPE

: SUBMIT ALL CALCULATIONS/ WORK- OUT DETAILS WITH THE ANSWER SHEET

QUESTION 1

I. In a recent survey, investigators found that the prevalence of Disease A was higher than the prevalence of Disease B. The incidence and seasonal pattern of both diseases are similar. Explanations consistent with this observation include:

   A. Patients recover more quickly from Disease A than from Disease B
   B. Patients recover more quickly from Disease B than from Disease A or patients die quickly from Disease B but not from Disease A
   C. Patients die quickly from Disease A but not from Disease B
   D. Both diseases are spread the same way thus the similar incidence

II. A recent train derailment exposed residents of a community to a chemical hazard. Many residents became ill; some died. To calculate the **probability** or **risk** of illness, which denominator would you use?

   A. The size of the population at risk at the beginning of the period
   B. The size of the population at risk at the midpoint of the period
   C. The size of the population at risk at the end of the period
   D. The average size of the population at risk during the period

III. During the second week of February, 87 persons in a small community (population 460)attended a social event which included a meal prepared by several of the participants.Within 3 days, 39 of the participants became ill with a condition diagnosed assalmonellosis. The attack rate among participants was:

   A. 0.45/100
   B. 18.9/100
   C. 44.8/100
   D. Cannot be calculated from the information given

IV. A questionnaire was administered to the persons who attended the social event described in the previous question. The two-by-two table shown below summarizes the relationship between consumption of potato salad and illness.

	Ill	Well	Total
Exposed	36	12	48
Unexposed	3	36	39
Total	39	48	87

The best estimate of the relative risk is approximately:

A. 1.7
B. 3.7
C. 9.7
D. 36.0

V. Numerator = number of children with Down syndrome who were younger than 12 yearsof age in Georgia on July 1, 1991 Denominator = total number of children who were younger than 12 years of age in Georgia on July 1, 1991

A measure using the numerator and denominator described above is an example of a/an:

A. Incidence rate
B. Attack rate
C. Person-time rate
D. Point prevalence

VI. The most common way(s) that a local health department uncovers outbreaks is/are by:

A. Receiving calls from affected residents or receiving calls from health care providers

B. Reviewing all case reports received each week to detect common features
C. Performing descriptive analysis of surveillance data each week
D. Performing time series analysis to detect deviations from expected values based on the previous few weeks and comparable time periods during the previous few years

VII. In an ongoing outbreak of a disease with *no* known source and mode of transmission, the primary reason for an investigation relates to:

A. Prevention and control
B. Training of staff
C. Learning more about the disease
D. Being responsive to the concerns of the community

VIII. The primary distinction between the terms "outbreak" and"epidemic" is:

A. "outbreak" does not imply that the cases are all related
B. "outbreak" implies a grouping of cases but not necessarily more than expected
C. "outbreak" is limited to fewer than 20 cases, epidemic to more than 20
D. "outbreak" does not generate as much anxiety among the public

IX. The ultimate purpose for characterizing an outbreak by time, place, and person is to:

A. Identify errors and miscodes in the data
B. Provide a comprehensive description of an outbreak by portraying its time course, geographic extent, and populations most affected by the disease
C. Ensure that all true cases are captured by the surveillance system
D. Generate hypotheses

X. For a disease of unknown etiology and incubation period, an epidemic curve can be used to derive which of the following?

A. Peak dates of onset of the illness and probable period of exposure
B. Peak dates of reporting of the cases to the health department
C. Future direction of the epidemic
D. The person affected

[20 marks]

QUESTION 2

a) List 3 factors that increase the observed prevalence and 3 factors that decrease observed prevalence. [6]
b) What are the modes of transmission you know [2]
c) Explain the infectious disease process [10]
a) Some of the risk factors for heart disease are smoking, hypertension, obesity, diabetes, high cholesterol, inactivity, stress, and type A personality. Are these risk factors necessary causes, sufficient causes, or component causes? [2]

[20 marks]

QUESTION 3

a) What is ecological fallacy? [2]
b) What is the difference between observational studies and experimental studies? [4]
c) State three limitations of cohort studies and also 3 limitations of case control studies [6]
d) List two strengths of a cohort study [4]
e) What is a cross sectional study? [2]
f) What is the difference between program trial & program review? [2]

[20 marks]

QUESTION 4

1. What is an association? [2]
2. What is the difference between relative risk and relative difference? [2]
3. 25 people attended a wedding. A total of 15 people ate beef while the rest ate chicken. After two days, 10 of the people who ate beef developed a severe gastro-enteritis. Out of the 10 who ate chicken, only 3 developed the gastro-enteritis.
   a) What study design is this and why? [4]
   b) Draw a 2x2 table illustrating the above [4]
   c) Calculate incidence in both exposed and none exposed [4]

   Using both the relative risk (RR) and relative difference (RD), calculate the association between eating beef and developing severe gastro-enteritis and state the direction of the association. [4]

[20 marks]

QUESTION 5

1. List with examples 2 proximate and 2 underlying factors affecting morbidity & mortality [4]
2. Factor A plus factor B causes condition X. Factor B can also cause condition X. However Factor A, factor B and factor C can also cause condition X.
   a) What can be said about Factor A? [2]
   b) What can be said about Factor B? [2]
   c) What can be said about Factor C? [2]
3. List and explain 4 of Sir Austin Bradford Hill's guidelines for assessing causation besides the dose response relationship [8]
4. Using the causal pies, what is a component cause? [2]

[20 marks]

QUESTION 6

a) As an Environmental health specialist, you are required to ensure that you have a control and surveillance plan for communicable diseases put in place.

   i. What are the objectives of the control and surveillance plan? [5]

   ii. Once an outbreak hit your area of jurisdiction, as the environmental health specialist, you will be required to conduct an outbreak investigation. What are the components of an outbreak investigation? [3]

b) What is response bias and how to prevent it? [4]

c) What are the two types of information bias? Explain each [5]

d) What are the necessary conditions for a factor to be a confounder? [3]

[20 marks]