UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science

BSc. ENVIRONMENTAL HEALTH

RE-SIT EXAMINATION PAPER 2018

TITLE OF PAPER	:	FUNDAMENTALS OF EPIDEMIOLOGY
COURSE CODE	:	EHS207
DURATION	:	2 HOURS
MARKS	:	100
INSTRUCTIONS	:	READ THE QUESTIONS & INSTRUCTIONS CAREFULLY
	:	ANSWER FOUR QUESTIONS
	:	**QUESTION ONE IS COMPULSORY** THEN CHOOSE ANY THREE QUESTIONS
	:	EACH QUESTION **CARRIES 25** MARKS
	:	INDICATE YOUR PROGRAM IN THE ANSWER SHEET
	:	WRITE NEATLY & CLEARLY
	:	NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM.
	:	BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

QUESTION 1

Diseases are classified into 2 categories; clinical and sub-clinical. It is important to recognize the broad spectrum of diseases' severity. This can be explained using the iceberg concept of diseases. This explains the importance of not only concentrating on clinically apparent cases as even the sub-clinical cases are still capable of spreading the disease.

a) Explain the iceberg concept of infectious diseases at the cell and host level.   [12]

b) Discuss the types of non-clinical diseases.   [8]

c) Understanding the broad spectrum of diseases severity is important in the control and prevention of diseases from spreading from one person to another. Discuss severity and the factors that relates to severity of a disease.   [5]

[25 MARKS]

QUESTION 2

The incubation period is crucial in the investigation and control of epidemics or outbreaks. This is because it helps in the control of outbreaks when tracing back to the source of infection.

a) Define the meaning of incubation period.   [2]

b) What are the factors that determine the incubation period? Explain them in depth. [6]

c) According to reports from Company Y, last night's party ended in a tragedy as some members of the staff were rushed to hospital after complaining of stomach cramps and some even vomiting profusely. This happened during the company's office party which took place in one of the famous hang-out spots in the city. This party was organised by management as a means to show appreciation of the great job done in obtaining some multi-million Emalangeni tender. A total of 23 people attended the party whereby 4 were from the management position. A total of 7 members of staff had to be rushed to Hospital D. It is believed that the misfortune was associated to what they ate at the party. According to investigations, the party started at 7pm where snacks and some drinks were served during the speech ceremony then around 1945 hours, the main meals were served in a buffet setting. At around 2030 hours, one lady

complaint of the cramps and asked to be excluded from the party. It was assumed that she was probably catching some flue and was driven home. However, around 2200 hours, 5 members of the stuff complaint of stomach cramps and 2 of these were rushed to hospital as they were profusely vomiting. The other 3 preferred to be driven to their respective homes. Nonetheless, by 2300hrs, 8 people were vomiting profusely, and 3 were rushed to hospital. It was reported though that one of those who were driven home, was rushed to hospital as the situation worsen while at home. The driver was also rushed to hospital after returning to drop one of staff members at home and that was after 2300 hours. The issue of the driver however complicated the investigation as he was not present at the party but was only called to assist with transporting the sick members. Some people believed then that the disease is therefore airborne. All this misfortune resulted in management promising to investigate and assist with getting to the cause of the problem.

i)   Represent this scenario in an epidemic curve.   [8]

ii)   What type of outbreak is represented in the scenario? Explain.   [3]

iii)   What could be the possible explanation for the driver?   [3]

iv)   What additional information would you need as an Epidemiologist in this investigation indicating the sources of that information too?   [3]

[25 MARKS]

QUESTION 3

Studies have established that history of parent smoking is associated with low birth weight. However, it is important to note that other factors such as characteristics of the smoker are vital in this association. In a study to establish this association in Country X, whereby records from the local hospital were used to select the study population. Inclusion criteria included a mother who only gave birth to one baby. A total of 1340 babies were included in the study of which 750 had a low birth weight. Out of the 1340 babies, 835 were from mothers whom when probed reported to have smoked in their life time. Of these 835 mothers only 534 had babies with low birth weight.

a) Discuss the 5 guidelines for determining whether an association is causal of not. [10]

b) Represent the findings of the study above in a 2x2 contingency table.   [4]

c) Is there an association between history of parent smoking and low birth weight baby? Show all your calculations.   [6]

d) What are the possible causes of bias for this study and how could they have been prevented?   [5]

[25 MARKS]

QUESTION 4

A week back, the Ministry of Health in country Epidemia reported that there has been a breakthrough in the prevention of dementia among the elderly population. It was reported that it has been established that in this population Dementia is caused by sad memories left by the aftermaths of World War II as most of these elderly men are survivors of the war and most of the women lost their loved ones during the war. Therefore, the health officials in the country concluded that this elderly population needed constant therapy to help them cope with their loss and keep their mind active. This report has caused uproar among the public health professionals as they believed that the use of the term "cause" is inappropriate.

a) Discuss the term cause describing the 2 types of disease causal pathways.   [4]

b) These causal pathways in (a) are further described by the different factors involved in the pathways such as necessary and sufficient factors.

Using the casual pathway pies, describe the 4 different factors involved in the production of a disease.   [8]

c) The evidence of a causal relationship is explained by Koch in his postulates. Discuss the 4 postulates for causality by Koch.   [8]

d) As an Epidemiologist, what are the short falls of the conclusion from the Ministry of Health? Discuss this in terms of the conditions to consider before concluding that Dementia is caused by aftermath of the World Word II.   [5]

[25 MARKS]

QUESTION 5

Recently, Swaziland Epidemiology Unit reported that the prevalence of prostate cancer in the country is now higher than all the other types of cancers such as cervical and breast cancer. This has led the Unit into setting up programs to educate the public on the importance of early screening for the disease to enable early detection thus early diagnosis for early treatment and prevention of complications. The proponents of screening for early detection of diseases believe that there is enough evidence proving that screening is beneficial to the public.

a) Discuss the 7 questions or components to be considered in deciding that early screening is beneficial for early detection of diseases for patients.   [14]

b) In a quest to establish that the current PSA screening test is effective, a total of 950 men were enrolled in the study where the prostate cancer prevalence is 10%. The sensitivity of this test is 90% while the specificity is 80%.

   i)   Present this information in a 2x2 table showing all the calculations.   [8]

   ii)   The positive predictive value (PPV) is also important too in determining the effectiveness of the test. Explain its importance and calculate it.   [3]

[25 MARKS]