UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF COMMUNITY HEALTH NURSING

SUPPLEMENTARY EXAMINATION: JULY 2017

COURSE TITLE: COMMUNITY HEALTH NURSING IV (EPIDEMIOLOGY)

COURSE CODE: NUR 521

TIME ALLOCATED: 2 HOURS

MARKS ALLOCATED: 75

INSTRUCTIONS:

1. **PLEASE ANSWER ALL THREE QUESTIONS**

2. **USE THE PROVIDED ANSWER BOOKLET FOR ALL YOUR ANSWERS**

3. **START ALL QUESTIONS IN A NEW PAGE**

4. **USE BULLETS FOR EACH POINT IN YOUR ANSWERS (DO NOT INVENT YOUR OWN NUMBERING)**

5. **CHECK THAT YOUR QUESTION PAPER HAS 10 PRINTED PAGES**

6. **DO NOT OPEN THE QUESTION PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR**

QUESTION 1: Multiple Choice Questions

For each of the following questions, write clearly the letter that corresponds with the most appropriate answer e.g. 1.16 D

1.1 In epidemiological terms, the total number of new cases of a disease occurring in a given population during a particular period of time is known as _____.
   A. Prevalence
   B. Pandemic
   C. Incidence
   D. Epidemic

1.2 A disease rate is:
   A. A measure of how fast a disease occurs in a population
   B. A measure of frequency of a disease in a population
   C. A measure of risk of a disease in a population
   D. Both A and C

1.3 Which of the following is not true about prevalence?
   A. Is an estimate of the risk of developing disease in a population
   B. Will decrease if the incidence is less than the number of deaths in a population
   C. Prevalence includes both new and old cases in the denominator
   D. Both A and C

1.4 In epidemiology, the risk of contracting a disease is:
   A. the danger that disease poses to the general population
   B. measured by the magnitude of the prevalence of that disease
   C. the probability of getting infected with the disease within a specified time period
   D. All of the above

1.5 A community health nurse administering immunizations to an infant is practising:
   A. Primary prevention
   B. Secondary prevention
   C. Tertiary prevention
   D. Natural immunity

1.6 Endemic means that a disease_____
   A. Occurs clearly in excess of normal expectancy
   B. Is habitually present in human populations
   C. Affects a large number of countries simultaneously
   D. is a world-wide outbreak

1.7 In the study of an outbreak of an infectious disease, plotting an epidemic curve is useful for all the following, except:
A. It helps to determine what type of outbreak has occurred
B. It shows whether herd immunity has occurred
C. It helps to determine the median incubation period
D. Both A and C

1.8 Which of the following is an advantage of active surveillance?
A. requires less project staff
B. is relatively inexpensive to employ
C. more accurate due to reduced reporting burden for health care providers
D. easy to establish initially

1.9 A survey was conducted among non-hospitalized adult population of the United States during 1988 through 1991. The results from this survey are shown below.

Age Group	Persons with Hypertension (%)
18–29 years	4
30–39 years	10
40–49 years	22
50–59 years	43
60–69 years	54
70 and older	64

The researchers stated that there was an age-related increase in the risk of hypertension in this population. You conclude that the researchers' interpretation:
A. is correct
B. is correct because it was based on rates
C. is incorrect because incidence rates do not describe risk
D. is incorrect because prevalence is used

1.10 Epidemiologists are interested in learning about:
A. The causes of diseases and how to cure them
B. The frequency and geographic distribution of disease
C. The causal relationship between diseases
D. All of the above

1.11 What questions does analytic epidemiology seek to answer?
   A. Who, what, where
   B. When, what, why, how
   C. How, why
   D. Who, what, why, where, how, when

1.12 The interval between exposure to an infectious agent and appearance of signs and symptoms is called:
   A. Quarantine period
   B. Isolation period
   C. Subclinical stage
   D. None of the above

1.13 Which of the following incorrectly defines a carrier?
   A. An individual who harbours the disease and can infect others
   B. An individual who harbours the agent, and will not get sick from the disease caused by the agent
   C. An individual who harbours the agent and can infect others
   D. None of the above

1.14 Disease transmission can be directly or indirectly. A vector such as a mosquito is an example of
   A. Direct transmission
   B. Common vehicle exposure
   C. Vertical transmission
   D. Indirect transmission

1.15 The resistance of a population to an attack by a disease to which a small proportion of the members of the group are immune is referred to as _____.
   A. Population immunogenesis
   B. Group resistance
   C. Herd immunity
   D. None of the above

[Total: 15 marks]

QUESTION 2

2.1 Explain the objectives of epidemiology? [5]

2.2 A class of 73 UNISWA students recently attended a one day national event in southern part of Swaziland. A day later, 15 of the students reported having diarrhea. You concluded that this was a single, common vehicle exposure outbreak. What was the attack rate of diarrhea among this class of students? [2]

2.3 Explain the steps epidemiologists should follow when investigating an acute outbreak of an infectious disease. [8]

2.4 Using your knowledge of the dynamics of disease transmission, explain why disease does not develop immediately at the time of infection. [3]

[Total: 18 marks]

QUESTION 3

One thousand men who were working in factory A were screened for HIV on 1 January 2002 and 50 of them were found to be positive for HIV antibodies. The screening was repeated in the same 1000 men on 1 January 2003, and this time, 62 men were positive, including the 50 men who were positive on the first screening (no one had died or was lost to follow-up).

Calculate:

3.1 The prevalence of HIV in men working in factory A on 1 January 2002 and on 1 January 2003? [6]

3.2 The incidence of developing HIV infection in men working in factory A in 2002? [4]

3.3 Is the answer in 3.2 above a measure of cumulative incidence or an incidence rate? [1]

One thousand men from factory B were screened for HIV on 1 January 2002 and 50 men were found to be HIV-positive. All men were tested for HIV once a month until 31 December 2002. Twelve men became HIV-positive during these 12 months. **Figure 1** (on page 2) shows when these 12 men became HIV-positive. Tests were carried out at the end of the month. The remaining 938 men were still HIV-negative by 31 December 2002. No one died or was lost to follow-up during this period.

Figure 1
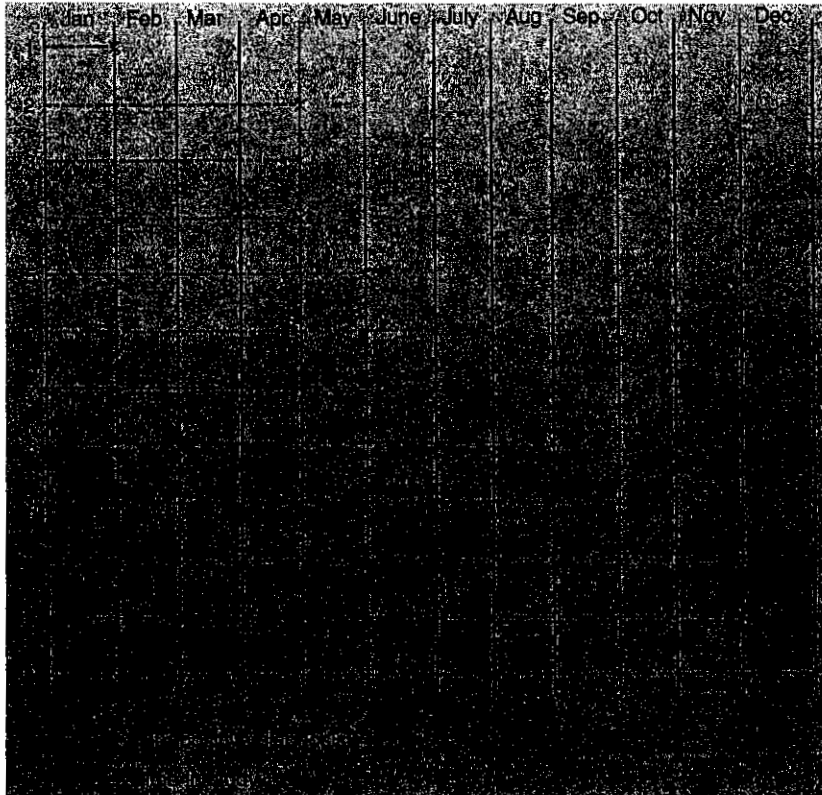
3.4 What was the incidence rate of HIV infection in men working in factory B?   [5]

[Total = 16 marks]

QUESTION 4

In 1960, investigator A took a simple random sample of 1,050 adults from an urban community. After examining the entire sample of 1,050, she had detected 50 cases of disease Q, a chronic disease for which there is no recovery or cure. In 1965, investigator A re-examined all of the survivors from her original study population and determined the cause of death in those who had died since the first examination. Of the 50 subjects in whom disease Q was detected in 1960, 40 had died prior to being re-examined in 1965. Of those who did not have disease Q in 1960, 100 subjects developed it between 1960 and 1965 including 50 subjects who died prior to re-examination (presumably due to disease Q). Among the subjects who did not contract disease Q, 15% had died from other causes between the 1960 and 1965 examinations.

Calculate the following measures:

4.1 The 5-year case fatality for disease Q in the study population   [4]

4.2 The proportionate mortality of disease Q in the study population during the 5 year period [4]

4.3 The mortality rate from disease Q during among the study population during the 5 year period (N.B. Assume that the study population was 950 in 1963).   [4]

[Total = 12 marks]

QUESTION 5

A physical examination was used to support a diagnosis of breast cancer in 2 500 women who had been previously diagnosed with breast cancer and in 5 000 control women (previously diagnosed to be without breast cancer). The results of the physical examination were positive (i.e., a mass was palpated) in 1 800 cases and were also positive in 800 control women.

5.1 What was the sensitivity of the physical examination? [3]

5.2 What was the specificity of the physical examination? [3]

5.3 What was the positive predictive value of the physical examination? [3]

5.4 What do the answers in 3.2 and 3.3 above tell you about the accuracy of the physical examination in diagnosing breast cancer? [2]

5.5 Mention three (3) factors that might cause the variations in the tests mentioned in the scenario above [3]

[Total: 14 marks]