

# UNIVERSITY OF SWAZILAND

## FACULTY OF HEALTH SCIENCES

### SUPPLEMENTARY EXAMINATION PAPER – JULY 2005

TITLE OF PAPER : EPIDEMIOLOGY AND COMMUNICABLE DISEASES

COURSE CODE : HSC 303

TIME : 3 HOURS

MARKS : 100

INSTRUCTIONS : ANSWER **FIVE** QUESTIONS IN ALL.

: AT LEAST **TWO** QUESTIONS MUST BE ANSWERED FROM EACH SECTION

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

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

: ALL CALCULATIONS/WORKOUT DETAILS SHOULD BE SUBMITTED WITH YOUR ANSWER SHEET

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

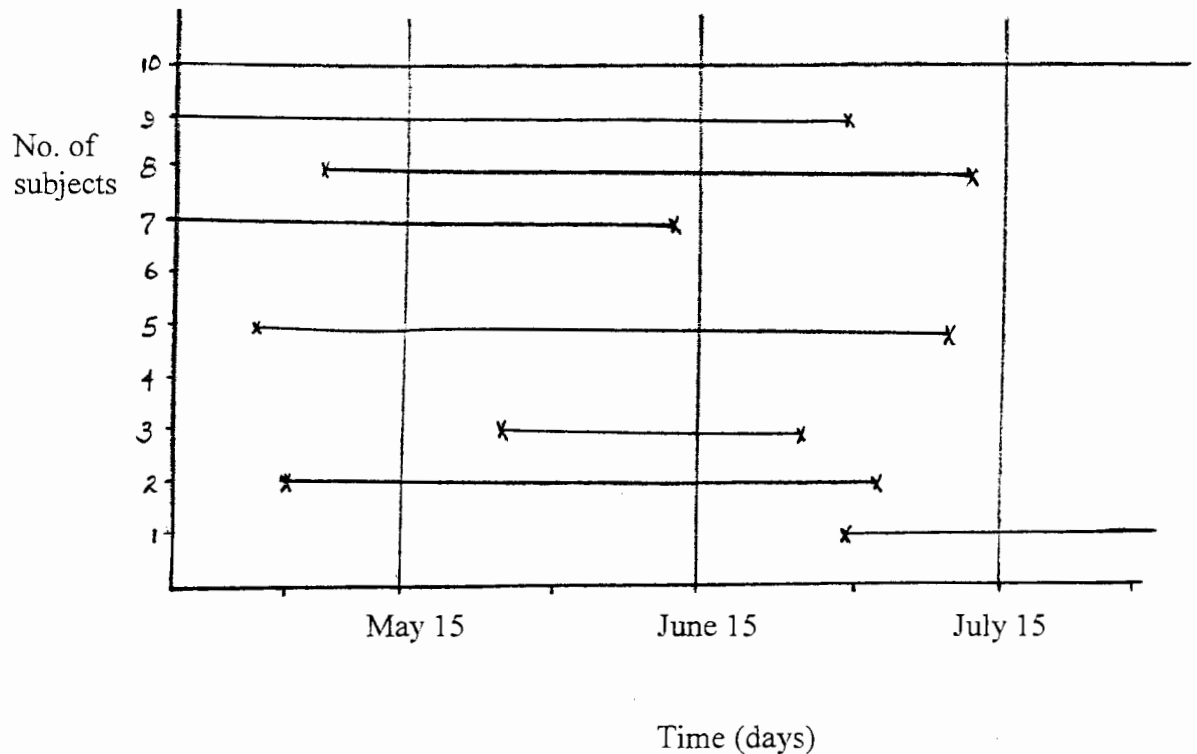
**DO NOT OPEN THIS EXAMINATION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR**

## SECTION A : INTRODUCTION TO EPIDEMIOLOGY

ANSWER AT LEAST **TWO** QUESTIONS FROM THIS SECTION. QUESTION 1 IS COMPULSORY.

### QUESTION 1 COMPULSORY

- a. A study for the survey of hypertension was done using 10 subjects that were screened and then followed up for a period of three months. The following graph was produced from the results.



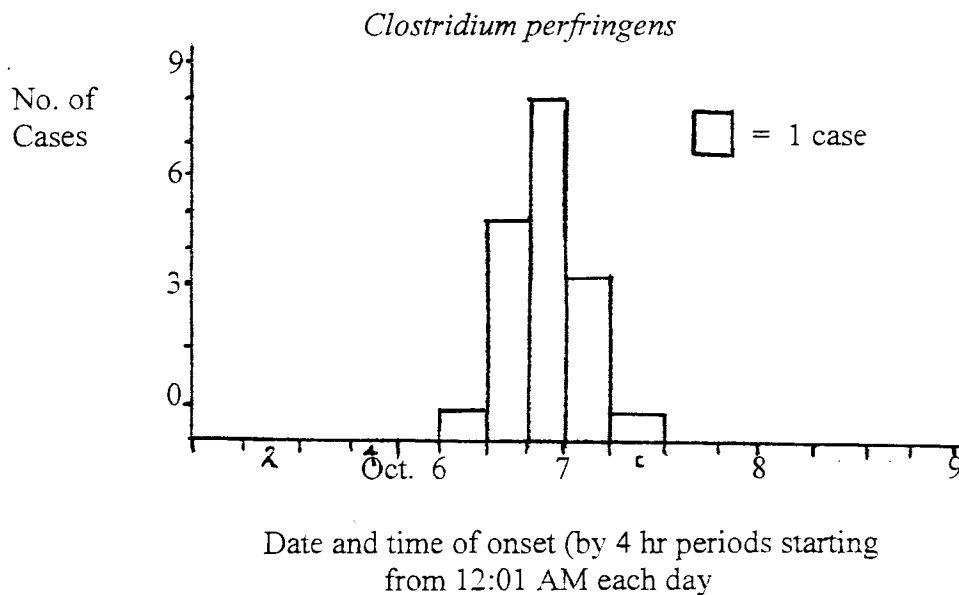
- What was the incidence rate of the hypertension for the month of June and for the month of May. (4)
- Calculate the point prevalence for the 30<sup>th</sup> of June. (2)
- Calculate the period prevalence from the 15<sup>th</sup> of May to the 15<sup>th</sup> of July. (2)
- What was the point prevalence on the 2<sup>nd</sup> of May. (2)
- Write what you can make out about subject No. 8 (2)
- Write what you can make out about subject No. 7 (2)

b. Use the table below to answer questions i, ii, and iii below. Indicate your response by writing the letter corresponding to your chosen answer.

Disease or Agent	Incubation periods		
	Minimum	Average	Maximum
<i>C. perfringens</i>	8 hrs	10 – 12 hrs	22 hrs
Leptospirosis	4 days	10 days	19 days
Measles	8 days	10 days	13 days

i. The probable period of exposure associated with the cases in the graph below is:

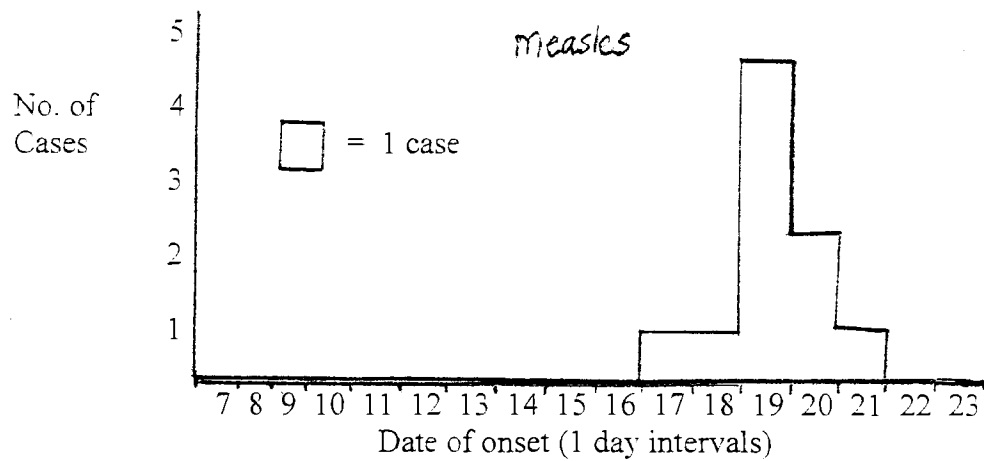
- A. October 6, period #2
- B. October 6, period #3
- C. October 6, period #4
- D. October 6, period #5



(2)

ii. The probable period of exposure associated with the cases in the graph below is:

- A. February 27 – 28
- B. March 4 – 7
- C. March 2 – 4
- D. March 8 - 9



(2)

iii. The probable period of exposure can be difficult to ascertain from common source epidemic curves because :

- A. Some of the cases could have been caused by a propagated source.
- B. Some of the cases could have been exposed to one source, some another.
- C. The dates of the onset of illness could be incorrect for some of the cases
- D. All of the above.

(2)

[20 markss]

## QUESTION 2

- a. Mention how you may prevent progression of disease from optimal health to altered health to subclinical disease to clinical disease and to death. (12)
- b. Which diseases are reversible and self limiting, infectious or chronic ? (1)
- c. Explain how the following variables may be used in describing epidemics :
  - i. place (2)
  - ii. time (2)
- d. mention THREE sources of vital statistics data. (3)

[20 marks]

### QUESTION 3

During a recent 34 month period there were a total of 158 admissions to the burn-trauma unit of a hospital, with 52 of the persons admitted subsequently experiencing an infection of the burn wound or skin graft site with *Staphylococcus aureus*.

- a. Calculate the attack rate of wound infection in this population due to *Staphylococcus aureus*. (1)
- b. For a comparable period before this 34-month period the attack rate in the same unit was 6.1 cases of *Staphylococcus aureus* wound infections per 100 admissions. Calculate the ratio of the attack rates for the two periods and interpret the result. (3)
- c. Forty-nine of the cases, and 129 of the persons admitted had some other type of trauma.
  - i. Calculate the attack rate among persons admitted with burns. (2)
  - ii. Calculate the attack rate among persons admitted to the unit with trauma other than burns. (2)
  - iii. calculate and interpret the ratio between these two rates. (3)
- d. The risk of *S. aureus* wound infection among burn patients was also assessed as a function of the length of time the patients were exposed to the hospital environment, as measured by their length of stay. A review of the medical records of each person admitted to the burn-trauma unit for burn treatment produced the following information :

Length of stay (Days)	No. of persons	No. of persons -days of exposure	No. of persons developing <i>S. aureus</i> wound infection
14 or less	82	676	11
15 +	47	1 457	38
TOTAL	129	2 133	49

- i. Calculate the infection rates per 100 person-days of exposure (i.e. per 100 patient days) for :
  - all persons, regardless of their length of stay, and (2)
  - separately for each of the two lengths of stay identified in the table : two weeks or less and greater than two weeks. (4)
- ii. Calculate and interpret the ratio of the rates obtained in (i), second part. (3)

[20 marks]

#### QUESTION 4

a. Explain the difference between the following terms as they apply to epidemiologic studies :

- i. generation time and incubation period (2)
- ii. index case and co-primaries (2)
- iii. active immunization and passive immunization (2)
- iv. isolation and quarantine (2)
- v. epidemic and endemic (2)

b. The first step towards the investigation of an epidemic is the preliminary analysis. Outline the steps taken in the preliminary analysis of an epidemic. (10)

**[20 marks]**

## SECTION B : COMMUNICABLE DISEASES CONTROL

Answer at least **TWO** questions in this section.

### QUESTION 5

Bacillary dysentery (shigellosis) is a mild infectious disease characterised by inflammations of the colon and rectum and also the presence of blood and mucus in the stool.

Utilizing the following topics, discuss bacillary dysentery :

- a. Reservoir of infection (1)
- b. Method of spread (4)
- c. Signs and symptoms of *Shigella sonnei* and *Shigella flexneri* dysenteries (7)
- d. Five (5) complications of bacillary dysentery (5)
- e. Three majors you would include in the tertiary level of prevention of this disease (3)

[20 marks]

### QUESTION 6

Syphilis is an infectious sexually transmitted disease of an acute and chronic relapsing nature. It has increased considerably throughout the world and is now 4<sup>th</sup> on the list of communicable diseases.

- a. Describe the mode of spread of syphilis (5)
- b. State five symptoms or signs of secondary syphilis (5)
- c. What would your health education topics include at primary level prevention of all sexually transmitted diseases (STDs) ? (10)

[20 marks]

### QUESTION 7

Though the estimate of measles as a killer disease has declined in recent years to 0.9 million (1991) due to the improved immunization coverage in developing countries (DCs), it is clear that measles poses a major public health problem in DCs.

Using the following topics, discuss measles (Morbilli):

- a. Definition (2)
- b. Signs and symptoms in the first, second and third stages of this disease (8)
- c. Preventive measures at primary level of prevention (10)

**[20 marks]**