

EXAMINATION QUESTION PAPER

Examination session:	FIRST OPPORTUNITY EXAMINATIONS				
Date	JUNE 2026				
Module code:	N5821PR				
Module name:	EPIDEMIOLOGICAL RESEARCH METHODS				
Paper duration:	3 HOURS	Total marks:	100	Number of pages: (inclusive of this page)	5
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INSTRUCTIONS TO INVIGILATORS AND STUDENTS

1. This paper consists of five (5) questions and Four (4) pages, excluding this cover page.
2. Answer ALL the Questions in the answer booklet provided.
3. Work in an orderly way and present your work as neatly as possible.
4. Number your questions correctly and clearly.
5. The use of a scientific calculator is permitted.

Section A

Question 1

1.1. Read the below scenario described below and answer the questions that follow:

The ‘Ondangwa Wedding’ outbreak

On Saturday, April 5, 2025, a large wedding celebration was held in a village near Ondangwa, Oshana region. This event was attended by approximately 350 guests. By Sunday evening, local clinics began reporting an influx of patients presenting with acute abdominal cramps, vomiting and profuse diarrhea. Initial interviews suggest that symptoms appeared between 6 and 24 hours after the wedding feast with menu items of traditional beef stew, potato salad and home-brewed beverages.

You are the Field Epidemiologist assigned to conduct the initial descriptive investigation:

- 1.1. Explain how you would apply the three pillars of descriptive epidemiology to this wedding scenario. [6 marks]
- 1.2. For each pillar, identify one specific variable and explain how analyzing that variable might help identify the source. [6 marks]
- 1.3. As the lead investigator, you conduct a site visit to the wedding venue in Ondangwa. Discuss any three (3) critical environmental factors related to food safety that you will assess to help identify the potential point of contamination. [6 marks]
- 1.4. Your team successfully retrieves leftover samples of the beef stew and potato salad. Explain how you would use this new physical evidence may support your investigation. [3 marks]
- 1.5. Based on your findings and the potential for further cases, suggest two (2) immediate public health actions you would recommend to the Ondangwa local authorities to prevent further spread of the illness among the wedding guests and their families. [4 marks]

[25 MARKS]

Section B

Question 2

A study was conducted to examine the relationship between a high fat diet and heart attacks in women. None of the women had ever had a heart attack before the start of the study. The “exposed” were women who had a high fat diet and the “unexposed” were women who had a low-fat diet. After 10 years of follow-up, the results are reported below:

Table 1: Total number of women included in the different groups of the study.

	Heart attack	No heart attack	Total Individuals
Exposed	a)	927	b)
Unexposed	57	c)	d)
Total	e)	1790	1900

Table 2: Person time in years contributed by each group:

		Person-Time in Years
Exposed	90 stayed in the study 8 years	
	80 women stayed in the study 5 years	
	50 women stayed in the study 2 years	
	The remaining women stayed in the study all 10 years	
Unexposed	60 women stayed in the study 8 years	
	20 women stayed in the study 7 years	
	The remaining women stayed in the study all 10 years	

2.1. What type of study design was used in the above scenario?

[2 marks]

2.2. Fill in the 12 empty cells in both table 1 and table 2. [7 marks]

2.3. Calculate the risk ratio of heart attacks in the exposed compared to the unexposed and interpret this ratio. [4 marks]

2.4. Discuss the disadvantages of choosing this design specifically for investigating chronic conditions like heart disease in the Namibian context. [3 marks]

2.5. In a long-term study such as the one described here, loss to follow-up is common. Describe any three (3) reasons for loss to follow-up in this study.

[6 marks]

[25 MARKS]

Section C

Question 3

Read the below scenario described below and answer the questions that follow.

Scenario:

Health Officers at B2Gold Otjikoto Mine in Namibia have noticed an increasing number of veteran employees presenting with chronic Obstructive Pulmonary Disease (COPD). To investigate whether underground dust exposure is the primary cause of this condition, you are tasked to conduct a case-control study and the following are your statistics:

Cases: 100 miners diagnosed with COPD in the last 2 years

Controls: 200 miners with no respiratory symptoms, matched by age and smoking status.

Exposure: "Underground workers" (high dust exposure) VS "Clerical/Administrative workers" (low/no dust exposure).

Among the 100 cases, 80 worked underground and 20 were clerical.

Among the 200 controls, 60 worked underground and 140 were clerical.

Questions:

3.1. Construct a 2x2 table using the data provided above. [5 marks]

- 3.2. From the 2x2 table, determine the Odds Ratio and interpret what it means. [5 marks]
- 3.3. Justify why a case-control study is more appropriate for investigating COPD in this specific mining population. [4 marks]
- 3.4. Discuss two (2) types of biases that may be associated with this type of design. [4 marks]
- 3.5. Describe how the 'Healthy Worker Effect' might lead to an underestimation of the association between underground dust and COPD in this study. [4 marks]
- 3.6. Identify three (3) specific sources of existing data that you would consult as a Field Epidemiologist to establish baseline levels of the disease among these workers. [3 marks]
- [25 marks]**

Section D

Question 4

- 4.1. Discuss the concept of bias in epidemiological studies. Illustrate with examples and suggest strategies to minimize them. [8 marks]
- 4.2. During an outbreak of foodborne illness in a prison, you are tasked with developing a questionnaire to collect data from affected and unaffected individuals. Outline the key steps in designing this questionnaire, including the types of information you would collect. [10 marks]
- 4.3. Discuss the ethical challenges in conducting epidemiological research in settings such as prisons and suggest strategies to ensure ethical standards are maintained. [7 marks]

[25 MARKS]

-----**GOOD LUCK**.....