UNIVERSITI KUALA LUMPUR
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

FINAL EXAMINATION

MARCH 2025 SEMESTER

COURSE CODE	:	HRB20203
COURSE TITLE	:	OCCUPATIONAL EPIDEMIOLOGY
PROGRAMME NAME	:	BACHELOR OF OCCUPATIONAL SAFETY & HEALTH (HONOURS)
DATE	:	30 JUNE 2025
TIME	:	2:00PM - 5:00PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.

2. This question paper is printed on both sides of the paper.

3. This question paper consist of ONE sections.

4. Section A consist of five questions. Answer FOUR (4) questions only.

5. Please write your answer on the answer booklet provided.

6. Please answer all questions in English only.

7. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

THERE ARE 5 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

A factory has reported a suspected increase in hearing loss among workers who operate near loud machinery. As an occupational epidemiologist, you are asked to investigate this issue.

You are given two study design options:

A retrospective cohort study using existing medical and employment records.

A case-control study comparing workers with hearing loss (cases) and those without (controls).

Answer all the following questions based on the situation above.

(a)   Compare and contrast the two study designs above. Include in your discussion their suitability, strengths, and limitations for investigating occupational hearing loss.

(10 marks)

(b)   Recommend the most appropriate study design for this investigation based on the factory's context. Justify your choice.

(5 marks)

(c)   Describe the key components of the study you propose, including study population, exposure, outcome, time frame and data source.

(10 marks)

Question 2

An occupational health team recorded 60 cases of lower back pain among warehouse workers in a company over six months. Most cases were among male workers aged 30–45, and occurred more frequently during night shifts. Analyze this situation using the descriptive epidemiology approach.

(a)   Analyse how the person, place, and time factors help in understanding the distribution of the disease.

(15 marks)

(b)   Deduce the conclusion from these patterns, and how might the findings guide workplace interventions?

(10 marks)

Question 3

A smart workplace uses IoT-based wearable sensors to monitor workers' exposure to heat and heart rate in a factory. Over 6 months, the data shows:
Workers with frequent high heat exposure have a heat exhaustion rate of 25 per 100 workers.
Workers with low heat exposure have a rate of 5 per 100 workers.
Answer all the following questions.

(a)   Based on the data, analyze whether there is an association between heat exposure and heat exhaustion.

(5 marks)

(b)   Discuss whether this association suggests a causal relationship by applying appropriate epidemiological criteria (e.g. Bradford Hill criteria).

(10 marks)

(c)   Explain how the use of IoT-based sensors can improve the evaluation of causal relationships in occupational epidemiology.

(10 marks)

Question 4

A study in a chemical factory found:
Workers exposed to benzene had a leukemia rate of 30 per 1,000
Non-exposed office staff had a rate of 5 per 1,000
Answer all the following questions based on this situation.

(a)   Based on this data, calculate and analyze whether there is an association between benzene exposure and leukemia.

(10 marks)

(b)   Discuss whether this association suggests a causal relationship, using appropriate epidemiological criteria.

(10 marks)

(c)   Describe how occupational epidemiologists can determine if the relationship is truly causal.

(5 marks)

Question 5

A company employs 2,000 workers. Over the past year, 80 workers developed asthma due to exposure to dust. At the same time, 200 workers were recorded to have asthma (including old and new cases).

(a)   Analyze how the incidence and prevalence of occupational asthma provide different insights into the health risks at the workplace.

(10 marks)

(b)   Interpret the meaning and calculation of each measure by comparing their use.

(10 marks)

(c)   Based on the data provided, analyze what the numbers reveal about the workplace environment and any necessary interventions needed?

(5 marks)

END OF EXAMINATION PAPER