

210  
PAPER A



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2023/2024 ACADEMIC YEAR**

**SECOND YEAR, FIRST TRIMESTER EXAMINATIONS**

**FOR THE DEGREE OF:**

**BACHELOR OF SCIENCE IN HEALTH  
PROFESSIONS EDUCATION, BACHELOR OF  
SCIENCE IN PHYSIOTHERAPY AND BACHELOR OF  
SCIENCE IN CLINICAL MEDICINE & COMMUNITY  
HEALTH (DIRECT & UPGRADING)**

**COURSE CODE: HPE 222**

**COURSE TITLE: MEDICAL EPIDEMIOLOGY**

**DATE: WEDNESDAY 6<sup>TH</sup> DECEMBER 2023**

**TIME :2:00PM – 4:00PM**

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**INSTRUCTIONS TO CANDIDATES**

Answer all Questions

Sec A: Multiple Choice Questions (MCQ) (20 Marks)

Sec B: Short Answer Questions (SAQ) (40 marks)

Sec C: Long Answer Questions (LAQ) (40 marks)

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over.

## SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. A reservoir is the habitat where an infectious disease lives, multiplies and grows. Which of these is NOT a reservoir?
  - A. Bird
  - B. Hospital room floor
  - C. Door knob
  - D. Air
2. The most essential component of an effective Infection Prevention surveillance program is:
  - A. The capability to monitor everything
  - B. Collection of meaningful data
  - C. Outbreak detection
  - D. Complying with accreditation agencies
3. If you want to know the proportion of the disease that could be prevented by eliminating the exposure in the entire study population, you should calculate the
  - A. Attributable fraction
  - B. Attributable risk
  - C. Population attributable risk
  - D. Negative predictive value
4. The Cancer and Steroid Hormone (CASH) study, in which women with breast cancer and a comparable group of women without breast cancer were asked about their prior use of oral contraceptives is an example of which type(s) of study?
  - A. clinical trial
  - B. Case-control study
  - C. Observational study
  - D. Experimental study
5. The precision of an estimate of a relative risk depends on the ...
  - A. External validity of the study.
  - B. Size of the study.
  - C. internal validity of the study.
  - D. Study design..
6. In a cohort study the relative risk for COPD for moderate smokers versus non-smokers was 4. For heavy smokers compared to non-smokers the relative risk was 10. What would have been the relative risk for COPD in this study if the heavy smokers were used as the reference category?
  - A. For non-smoking 0.1 and for moderate smoking 0.4
  - B. For non-smoking 0.2 and for moderate smoking 0.6
  - C. For non-smoking 4 and for heavy smoking 10
  - D. This cannot be calculated with the available data
7. The problem of confounding can be solved by.
  - A. Choosing a prospective design.
  - B. Increasing the precision of the measurements.
  - C. Stratification during data analysis.
  - D. This cannot be solved
8. Indirect transmission does not includes which of the following?
  - A. Droplet spread
  - B. Mosquito-borne
  - C. Foodborne
  - D. Doorknobs or toilet seats

9. An epidemiologist in Tanzania wants to study the efficacy of iron supplementation for the prevention of HIV infection. He wants to make sure that only subjects who are (still) free of HIV infection are enrolled in his trial. Therefore, he screens a large group of people using a diagnostic test. Based on the outcome of the test, he decides who could participate in his iron supplementation trial. For this purpose, it is very important that the diagnostic test has a high...
- Sensitivity
  - Positive predictive value
  - Specificity
  - Negative predictive value
10. A diabetes test is being applied in a population of 5000 men. Previous evaluation of the diabetes test in a different population showed a sensitivity of 70% and an specificity of 80%. The prevalence of diabetes is 0.5%. What is the diagnostic value of a positive test in this situation?
- 2 %
  - 47 %
  - 4 %
  - 70 %
11. Researchers prospectively follow a group of 100 vegetarians and 200 non-vegetarians. After 30 years of follow-up, 8 of the vegetarians and 20 of the non-vegetarians develop heart disease. The 95% confidence interval on the relative risk of 0.8 ranges from 0.6 to 0.9. Select the best statement.
- Vegetarians were 80% less likely to develop heart disease during 30 years of follow-up compared with non-vegetarians.
  - The researchers should have calculated an odds ratio rather than a relative risk.
  - The relative risk of 0.8 is not statistically significant as the 95% confidence interval contains the value 0.8.
  - Vegetarians were 20% less likely to develop heart disease during 30 years of follow-up compared with non-vegetarians.
12. In a case-control study the association was examined between smoking and risk of Parkinson's disease. The table below provides the results. Which of the following odds ratios is correct?

	Controls	Cases
Smokers	55	30
Non- smokers	45	70

- 0.35
  - 2.85
  - 1.83
  - 0.55
13. The clinical stage of disease begins with:
- Exposure to the agent
  - Pathological changes
  - The patient's first symptoms.
  - The time of diagnosis
14. In which field of epidemiology would you expect to see ecological studies?
- Descriptive epidemiology
  - Intervention studies

- C. Analytical epidemiology
  - D. Statistical analysis
15. In the epidemiological terminology human host is referred to as
- A. Soil
  - B. Seed
  - C. Extrinsic factor
  - D. None of them
16. Where a group of people with a specific condition receive a treatment and their progress is compared with a second group receiving a placebo or alternative treatment; this is known as epidemic \_\_\_\_\_.
- A. Case-control study
  - B. Cohort study
  - C. Community trial
  - D. Clinical trial
17. A specific case definition is one that:
- A. Is likely to include only (or mostly) true cases
  - B. Is considered "loose" or "broad"
  - C. Will include more cases than a sensitive case definition
  - D. May include mild cases
18. What does epidemiological measures of effect assess between an exposure and an outcome?.
- A. Strength of the causal mechanisms
  - B. Strength of the reversibility
  - C. Strength of the association
  - D. Strength of a confounding factor
19. In which one of the following circumstances will the prevalence of a disease in the population increase, all else being constant?
- A. If the incidence rate of the disease falls.
  - B. If survival time with the disease increases.
  - C. If recovery of the disease is faster.
  - D. If the population in which the disease is measured increases
20. A laboratory test has been developed to assess the risk of prostate cancer among men. Studies with human subjects involving repeated measures indicate that the test yields the same results for every individual again and again, However, other studies indicate that there is a very low correlation between this new test for prostate cancer and already- existing tests with proven track records. The areas of relative strength and relative weakness of this new test respectively are:
- A. Sensitivity and Specificity
  - B. Specificity and sensitivity
  - C. Reliability and validity
  - D. Validity and reliability

**SECTION B: SHORT ANSWER QUESTIONS (40 MARKS)**

1. Describe the 5W's of descriptive epidemiology (5marks)
2. Describe the components of evaluation in public health surveillance (5 marks)
3. Explain more specifically, instances why an epidemic occur (5marks)
4. Describe the traditional model of disease causation (5marks)

5. Describe the Natural History of malaria using the disease Timeline (5 marks)
6. Imagine that the incidence of HIV infection is compared in two communities, one who don't practice male circumcisions (A), the other practice male circumcisions (B). In the community A, there were 50 infections in a population of 100,000 and in community B, 10 Infections in a population of 100,000.
  - a) What is the relative risk of infections in the community (A)?
  - b) What is the relative risk of infections in the community (B) (5marks)
7. In another study of consumption of lemon and COVID-19, the COVID-19 infection rate among those consuming lemon was 0.07 per 1,000 persons per year. The infection rate among those not consuming lemon was 0.57 lung cancer deaths per 1,000 persons per year. Calculate the attributable proportion. (5marks)
8. Differentiate between Case control and cross-sectional epidemiological study (5 Marks)

### **SECTION C: LONG ANSWER QUESTIONS (40 MARKS)**

1. Discuss public health surveillance under:
  - a) Evolution of Surveillance
  - b) Critical characteristics of surveillance
  - c) Steps for conducting surveillance(20 marks)
2. Discuss the various Morbidity Frequency Measures (20 marks)

