



(University of Choice)

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

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

MAIN examination

**FOR THE DEGREE
OF
BACHELOR OF OPTOMETRY AND VISION SCIENCES (BOPTOM)**

COURSE CODE: NUR 300

COURSE TITLE: MEDICAL EPIDEMIOLOGY

DATE: 19/04/2022

TIME: 12-2PM

INSTRUCTIONS TO CANDIDATES

ANSWER ALL QUESTIONS (Total marks: 70%)

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This paper consists of 5 printed pages. Please Turn Over.

MULTIPLE CHOICE QUESTIONS: ANSWER ALL QUESTION (40 MARKS)

1. A disease vector is defined as?
 - A. organism that transmits a disease
 - B. symptom of a disease
 - C. environmental condition associated with a disease
 - D. a host to the disease causing organism

2. Most of the major health problems in the poorer nations are due to?
 - A. parasitic worms and microorganisms
 - B. psychological tension resulting from work
 - C. air pollution
 - D. non-communicable diseases

For questions 3 and 4 use the information below:

The population in the Kisumu city on March 30th, 2010 = 183,000.

Number of new active cases of COVID occurring between January 1st and June 30th 2021 = 26

Number of active COVID cases according to the city register on June 30th, 2021 = 264.

3. The incidence rate of active cases of TB for the 6-month period was:
 - A. 7 per 100,000 population
 - B. 14 per 100,000 population
 - C. 26 per 100,000 population
 - D. 28 per 100,000 population

4. The prevalence rate of active TB as of June 30th, 2010 was:
 - A. 14 per 100,000 population
 - B. 130 per 100,000 population
 - C. 144 per 100,000 population
 - D. 264 per 100,000 population

5. In cohort studies of the role of polluted air in the etiology of asthma among children in a city in Kenya, it is essential that:
 - A. There be equal numbers of persons in both study groups
 - B. At the beginning of the study, the children with the disease and those without the disease have equal risks of having been exposed to polluted air
 - C. Children in the study group exposed to polluted air and children not exposed to polluted air should be representative of the general population
 - D. The exposed and non-exposed groups under study be as similar as possible with regard to possible characteristics that may bias the results

6. Epidemiology is defined as the study of the distribution and determinants of health related states and events in populations and the application of this study to control of health problems. Which of the following is NOT a purpose of Epidemiology?
 - a) Determine the extent of disease in the community
 - b) Provide evidence for instituting correction for negligent epidemiologist
 - c) Study natural history and prognosis of disease
 - d) Evaluate preventive and therapeutic measures

7. Epidemiologists are required to have broad knowledge of varying disciplines that will enable them investigation, research, give evidence-based answers to issues of public health interest. Which of the below listed is NOT a core discipline of interest in epidemiological enquiry?
 - a) Clinical medicine
 - b) Statistics
 - c) Hydrology
 - d) Social anthropology

8. The three phenomena assessed in analytic epidemiology, called the basic triad of disease causation are Agent, Host and Environment relationship. Which of the following factors is included in HOST component?
 - a) Microbes
 - b) Personal behavior
 - c) Psychological experiences
 - d) Crowding

9. In the “basic triad” of disease transmission, the factors in the environment that *bring host and agent together*, all of the following EXCEPT?
 - a) Vector
 - b) Vehicle
 - c) Hibernation
 - d) Reservoir

10. In the historical development of epidemiology, the phrase; “*On Airs, Waters, and Places*” – Hypothesized that disease might be associated with the physical environment, including seasonal variation in illness. This work is associated with which of the below listed persons?
 - a) Doll & Hill (1950)
 - b) Hippocrates (400 BC)
 - c) John Graunt (1662)
 - d) John Snow (1850)

11. Which of the following achievement that contributed to the development of the study of epidemiology is attributed to John Snow?
 - a) Formulation of a natural epidemiological experiment to test the hypothesis that cholera was transmitted by contaminated water
 - b) Using a case-control design to describe and test the association between smoking and lung cancer
 - c) Engaging in an occupational lifestyle that led to investigation and understanding of Typhoid fever
 - d) Using the cohort design to study risk factors for cardiovascular disease in the Framingham Heart Study.

12. In modern epidemiological studies, emphasis on empirical systematic investigation, biology, and environment/host manipulation, is relevant for which aspect of epidemiological investigations?
 - a) Chronic disease investigation
 - b) Acute disease investigation
 - c) Clinical medical trial

- d) Statistical analysis of epidemiological data
13. Which of the below listed has contributed the LEAST in defining the roots of modern epidemiology?
- a) Statistics
 - b) Computer science
 - c) Physics
 - d) Managerial sciences
14. As at 2002, WHO reported which of the following causes of mortality worldwide, to be the most common cause of death in person younger than 60 years?
- a) Ischemic heart disease
 - b) Cerebrovascular disease
 - c) Lower respiratory infections
 - d) HIV/AIDS
15. As at 2002, WHO reported which of the following Causes of Disease Burden worldwide, to be the least common cause of disease burden, in terms of Disability Adjusted Life Years (DALYs) scores, in person Older than 60 years?
- a) Ischemic heart disease
 - b) Lower respiratory infections
 - c) Hearing loss, adult onset
 - d) Trachea, bronchus, lung cancers
16. Historically, in developing countries, there has been a marked shift in the leading causes of mortality from “infectious” to “chronic” diseases?
- a) TRUE
 - b) FALSE
17. Choose the INCORRECT OPTION. If a “cure” was found for heart disease, how might this likely affect mortality rates from: (1) AIDS; and (2) Cancer in the world?
- a) AIDS-related mortality would be largely unaffected since most deaths from AIDS occur in persons not at high risk (age) for heart disease mortality
 - b) Cancer mortality would increase since persons who would have died from heart disease would now be at risk of dying from cancer.
 - c) B is true due to the concept of “competing risks”, where one cause of mortality affects another
 - d) None of the above is true
18. Historically, the below listed are examples of unethical research on human subjects Except?
- a) Clinical trial for COVID 19 vaccine in Kilifi, Kenya (2020)
 - b) Jewish Chronic Diseases Hospital where 22 elderly patients were injected with cancer cells without their knowledge to test immunological response (1963)
 - c) Criminal and unscientific behavior of physicians in concentration camps in Nazi Germany (1947).
 - d) U.S. Public Health Service study of effects of untreated syphilis in Tuskegee, long after effective treatment for the disease was known (1936)

19. In the primary level of disease prevention, the goal is to promote general health and avoid risk factors for disease. Which of the following will NOT be true?
- Encouraging people to utilize protective measures to prevent susceptibility and pre-symptomatic disease
 - Encouraging people to stop smoking or choose not to start
 - Encourage people with lungs Cancer to stop smoking
 - Encouraging people at high of lungs Cancer to avoid areas where people are smoking
20. Which of the below listed will NOT be considered as secondary level of disease prevention?
- Early detection and timely treatment of diseases
 - Rehabilitation and prevention of further disease or disability
 - Routine pulmonary function tests for those at risk
 - Smoking cessation programs if patient smokes
21. Which of the below listed will be considered as a feature of High-Risk Approach to disease prevention?
- Preventive measure widely applied to an entire population (public health approach)
 - Striving for small absolute change among many persons
 - Relatively inexpensive and non-invasive approach
 - Often requiring clinical action to identify the high risk group and to motivate risk factor control.
22. Epidemiologists are interested in learning about?
- the causes of non-communicable diseases and how to cure or control them
 - the frequency and geographic distribution of diseases
 - the causal relationships between communicable and non-communicable diseases
 - why communicable diseases are rampant in developing countries
23. Diseases that are always present in a community, usually at a low, more or less constant, frequency are classified as having what kind of pattern?
- epidemic
 - endemic
 - pandemic
 - prevalence
24. Which of the following statements is true concerning epidemic diseases?
- They are usually not very contagious
 - At the end of an epidemic, a disease spreads at an increasing rate and then abruptly disappears.
 - They usually appear and disappear seasonally.
 - They are mostly common among adult population
25. An epidemic that becomes unusually widespread and even global in its reach is referred to as a:
- Pandemic
 - hyperendemic

- C. German measles
- D. endemic

26. A disease vector is defined as?
- E. organism that transmits a disease
 - F. symptom of a disease
 - G. environmental condition associated with a disease
 - H. a host to the disease causing organism
27. Most of the major health problems in the poorer nations are due to?
- E. parasitic worms and microorganisms
 - F. psychological tension resulting from work
 - G. air pollution
 - H. non-communicable diseases
28. In the study of an outbreak of an infectious disease, plotting an epidemic curve is useful because:
- A. It helps to determine what type of outbreak (e.g. single-source, person-to-person) has occurred
 - B. It shows whether herd immunity has occurred
 - C. It helps to determine the specific type of causative organism
 - D. It helps ascertain the incubation period
29. Which of the following is characteristic of a single-exposure, common-vehicle outbreak?
- A. Frequent secondary cases
 - B. Increasing severity with increasing age
 - C. Explosive
 - D. Cases include both people who have been exposed and those who were not exposed
30. A study was conducted among the non-hospitalized adult population of Kakamega between January 2018 to December 2021. The results from the study are shown below:

Age group (years)	Percent of persons with hypertension
18-29	4
30-39	10
40-49	22
50-59	43
60-69	54
70 and older	64

What type of study design was used here?

- A. Cross-sectional, point prevalence
- B. Cross-sectional, period prevalence
- C. Case-Control
- D. Cohort, prospective

31. For a disease such as pancreatic cancer which is highly fatal and of short duration:
- Incidence rates and mortality rates will be similar
 - Mortality rates will be much higher than incidence rates
 - Incidence rates will be much higher than mortality rates
 - Incidence rates will be unrelated to mortality rates
32. An advertisement in a medical journal stated that "2,000 subjects with sore throats were treated with our new medicine. Within 4 days, 94% were asymptomatic." The advertisement claims that the medicine was effective. Based on the evidence given above, the claim:
- Is correct
 - May be incorrect because the conclusion is not based on the rate
 - May be incorrect because no test of statistical significance was used
 - May be incorrect because no control or comparison group was involved
33. In cohort studies of the role of polluted air in the aetiology of asthma among children in a city in Kenya, it is essential that:
- There be equal numbers of persons in both study groups
 - At the beginning of the study, the children with the disease and those without the disease have equal risks of having been exposed to polluted air
 - Children in the study group exposed to polluted air and children not exposed to polluted air should be representative of the general population
 - The exposed and non-exposed groups under study be as similar as possible with regard to possible characteristics that may bias the results
34. The advantage of a prospective cohort study is?
- It usually costs less than a case-control study
 - Precise measure of exposure is possible
 - Prevalence rates can be calculated
 - Historical information is easy to collect
35. A case-control study is characterized by_____?
- Possibilities of comparing intervention and control groups
 - Patients with prevalent conditions are compared with those with new conditions
 - Incidence rates may be computed directly
 - Patients with disease of interest are compared with controls (without disease of interest)
36. Residents of three villages with three different types of water supply were asked to participate in survey to identify cholera carriers. Because several cholera deaths had occurred recently, virtually everyone present at the time underwent examination. The proportion of residents in each village who were carriers was computed and compared. What is the proper classification for this study?
- Cross-sectional study
 - Case-control study
 - Experimental study
 - Cohort study

37. Which of the following statements is true?
- A. A statistical relationship is sufficient evidence to infer causality
 - B. Temporal order of the cause and effect is not important in inferring causality
 - C. A statistical relation of X and Y is insufficient evidence for inferring causality
 - D. Temporal order of cause and effect variables and statistical relation are all that are needed to infer causality

38. The group that receives the experimental treatment condition is the:
- A. Experimental group
 - B. Control group
 - C. Participant group
 - D. Independent group

39. The group that does not receive the experimental treatment condition is the:
- A. Experimental group
 - B. Control group
 - C. Treatment group
 - D. Independent group

In July 2001, during an east Africa Economic Convention, in Nairobi, 11 attendees had died of apparent heart attacks by August 1. Dr. Wesonga contacted the Ministry of Health after realizing he had treated 3 of those 11 attendees.

40. What is the first step the Ministry of Health should follow towards mitigating the situation?
- a) Establish a surveillance system
 - b) Alert the convention attendees
 - c) Establish the existence of an outbreak
 - d) Send an investigation team to the hotel

SECTION B (ESSAY QUESTIONS): ANSWER ALL QUESTIONS (Total marks: 30%)

Question 1.

(20 marks)

Taking the recent Coronavirus (COVID 19) global outbreak. If you were invited to address a public secondary school in your local community. present a detailed account of a WHO recommended public health approach to mitigating and containing the pandemic, keeping in mind a strategy that is applicable within your local cultural, traditional and religious settings.

Question 2.

(5 marks)

Epidemiologists use a model for studying infectious disease and its spread that involves the microbe that causes the disease, the organism that harbors the disease, and the external factors that cause or allow disease transmission. Attempt a detailed discussion on the "Agent-Host-Environment" relationship of modeling a disease spread.

Question 3.

(5 marks)

Attempt a detail discussion of the various levels of diseases prevention.

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GOOD LUCK!