



(University of Choice)

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

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

MAIN

2019/2020 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER

SPECIAL/SUPPLEMENTARY EXAMINATIONS

**MEDICAL LABORATORY SCIENCES AND MEDICAL
BIOTECHNOLOGY**

COURSE CODE: BML 424

COURSE TITLE: COMMUNITY HEALTH AND EPIDEMIOLOGY

DATE: 16TH OCTOBER 2020

TIME: 8.00 – 10.00 AM

INSTRUCTIONS:

1. This paper consist of three sections (Section A , B and C)
2. Answer ALL the questions in section A and B any TWO questions in section C

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over

Section A : (20marks) Attempt all questions

1. An investigator takes a sample of healthy individuals, record their ongoing solar exposure, and relate that to the subsequent occurrence of skin cancer in the same group?
 - A. Case-control study
 - B. Ecological study
 - C. Cohort study
 - D. Cross-sectional study
2. How can geographical information system (GIS) help disease control? Choose the incorrect answer.
 - A. It can specify the high risk age group.
 - B. It can help us hypothesize possible risk factors.
 - C. It can evaluate the accessibility to the health service.
 - D. It can specify the place for targeted control.
3. In 1945 there were 1000 men who worked in a factory painting on watches. The incidence of bone cancer in these women was compared with that of 1000 women who worked as telephone operators in 1975. Twenty of the painters and four of the telephone operators developed cancer between 1945 and 1975. This study is an example of a:
 - A. Experimental study
 - B. Case series
 - C. Clinical trial
 - D. Cohort study
4. All of the following are true of odds ratio except:
 - A. It is the only measure of risk that can be obtained directly from a case-control study
 - B. It can be calculated without data on rates (as in case-control study)
 - C. It is the ratio of incidence in exposed divided by incidence in non-exposed
 - D. It is an estimate of relative risk
5. The requirements for an effective surveillance system include:
 - A. A diagnostic algorithm
 - B. Staff members
 - C. A sampling frame
 - D. All of the above
6. What can a researcher use the literature to achieve?
 - A. They can demonstrate their competence by referring to prominent writings in the field
 - B. They develop their version of the literature in such a way as to show and to led up to the contribution they will be making in their own project or article
 - C. All of the above
 - D. They can identify a gap or problem in the literature that corresponds to research questions
7. Confounding is a particular challenge in nutritional epidemiology because:
 - A. Different dietary components are correlated with each other, making it difficult to separate their effects
 - B. People change their diets over time
 - C. It is difficult to measure people's diets accurately in large studies
 - D. There are no good methods to adjust for confounding in nutritional studies
8. Surveillance data must be:
 - A. Rapidly collected b.
 - B. Use simple case definitions
 - C. Provide very precise estimates
 - D. All of the above e. a. and b. above
9. In epidemiological context, what is the population at risk?
 - A. The proportion of a population that engage in risky behaviors
 - B. The group of people that may experience the outcome we want to study

- C. A group of people participating in a study that may be harmful to them
 - D. The population group with the highest relative risk of disease
10. Which of the following statements about exposures is true?
- A. Exposure refers to contact with some risk factor that may be harmful to beneficial to health
 - B. An exposed individual has a greater risk of disease
 - C. Dietary intake is not an exposure because individuals make a choice about what they eat
 - D. High body mass index is a risk factor for a range of health conditions, therefore, it cannot be treated as a single exposure
11. For a disease such as Ebola fever, which is highly fatal and of short duration, which of the following statements is correct?
- A. Incidence rate and mortality rate will be similar
 - B. Mortality rate will be much higher than incidence rate
 - C. Incidence rate will be much higher than mortality rate
 - D. Incidence will be unrelated to mortality rate
12. 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
13. In an outbreak of cholera in a village of 2000 population, 20 cases have occurred and 5 died. Case fatality rate is:
- A. 1%
 - B. 0.025%
 - C. 5%
 - D. 0.25%
14. Which of the following factors play a key role in likelihood of infectious disease acquisition?
- A. Genetic profile
 - B. Human behavior
 - C. Environmental conditions
 - D. All of the above
15. Virulence is the:
- A. Ability to cause clinical disease
 - B. Ability to cause severe disease
 - C. The ability to evoke an immune response
 - D. All of the above
16. The basic code of ethical research (respect for persons, beneficence, and justice) was first established by the:
- A. Nuremberg Code
 - B. Declaration of Helsinki
 - C. CIOMS
 - D. Belmont Report
17. In which 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

18. The following table gives the results of a screening test for diabetes compared to a confirmatory evaluation (oral glucose tolerance test). **(Answer question 18 and 19 using this table)**

Test results	True diagnosis		Total
	Diabetic	Not Diabetic	
Positive	34	20	54
Negative	116	9830	9946
Total	150	9850	10000

The sensitivity of this screening test for diagnosing diabetes is:

- A. 23%
 - B. 29%
 - C. 63%
 - D. 99%
19. The most important element of ethical research on human subjects is:
- A. Beneficence
 - B. Justice
 - C. A methodologically sound study design
 - D. Informed consent
20. Choose the most appropriate explanation on “Prevalence rate”:

- A. the number of patients who have the disease at a particular time, divided by the population at risk of having the disease at that time.
- B. the number of new cases of a diseased in a population over a period of time.
- C. not useful for developing HIV/AIDS control programme.
- D. useful for developing Avian flu control programme.

SECTION B: SHORT ANSWER QUESTIONS (40 Marks)

1. Define the following terms as used in epidemiology 4 Marks
 - i. Prevalence
 - ii. Distribution
 - iii. Frequency
 - iv. Herd immunity
2. Briefly describe four functions of epidemiology 4 Marks
3. Giving examples, classify disease transmission in epidemiology 4 marks
4. Identify the basic principles of ethics that guide studies dealing with human subjects 4Marks
5. Highlight the advantages and disadvantages of cohort studies 4 Marks
6. Give any EIGHT classifications of communicable diseases 4 Marks
7. Briefly explain four methods of non-probability sampling methods used in epidemiological studies in Kenya 4 marks
8. Define Agent and Host as used in the epidemiological TRIAD 4 Marks
9. Differentiate passive and active surveillance 4 Marks
10. Give two advantages and two disadvantages of cross sectional studies 4 Marks

LONG ANSWER QUESTIONS (40 Marks)

9. The table below was drawn after doing a screening test and gives the results of blood sugar levels, 2 hours after a used version the glucose tolerance test for diabetes (golden standard) among 1000 person blood sugar. 20 Marks

		DIABETES STATUS		
		POSITIVE	NEGATIVE	TOTAL
BLOOD SUGAR	> 100 mg/ml	225	225	450
	< 100 mg/ml	25	525	550
Total		250	750	1000

Determine:

- i. Sensitivity of the blood sugar level test 2 Marks
 - ii. Specificity of the blood sugar level test 2 Marks
 - iii. Predictive value of a positive blood sugar level test 2 Marks
 - iv. Predictive value of a negative blood sugar level test 2 Marks
 - v. Proportion correctly classified 3 Marks
 - vi. Prevalence of diabetes 3 Marks
 - vii. Proportion of people who did not have diabetes but the test indicates they had diabetes 3 Marks
 - viii. Proportion of people who did have the disease but the test indicates they did not have the diabetes 3 Marks
10. Assume you the monitoring and evaluation officer in the department of public health in your facility, synthesize how you may evaluate the facility surveillance system 20 Marks
11. Disease does not occur randomly but happen upon the disturbance of the balance of the elements within ecological niche. The elements interact in a variety of ways for disease to occur. Using lung cancer as an example as discuss the Rothman's causal pie and component cause to explain disease causation 20 marks