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### **University Examinations 2024/2025**

#### **THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL MICROBIOLOGY**

#### **HMM 3312: PRINCIPLES OF EPIDEMIOLOGY**

**DATE: JANUARY 2025**

**TIME: 3 HOURS**

#### **INSTRUCTIONS:**

Answer *All* questions

*Ensure that all your answers are properly numbered*

*Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark*

*Part II: Short Answer Questions – Answer questions following each other on the answer booklet*

*Part III: Long Answer Questions – Answer each question on the answer booklet*

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#### **SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)**

1. Epidemiologists are interested in learning about
  - a) The causes of diseases and how to cure or control them
  - b) The frequency and geographic distribution of diseases
  - c) The causal relationships between diseases
  - d) All of the above
2. Diseases that are always present in a community, usually at a low, more or less constant, frequency are classified as having an \_\_\_\_\_ pattern.
  - a) Epidemic
  - b) Endemic

- c) Pandemic
- d) Incidence

3. Which of the following statements is true concerning epidemic diseases?

- a) They are usually not very contagious.
- b) At the end of an epidemic, a disease spreads at an increasing rate and then abruptly disappears.
- c) They usually appear and disappear seasonally.
- d) They usually affect different parts of the world at the same time or period

4. An epidemic that becomes unusually widespread and even global in its reach is referred to as

- a \_\_\_\_\_
- a) Pandemic
- b) Hyperendemic
- c) Spanish flu
- d) Prevalent

5. A disease vector is a(n)

- a) Organism that transmits a disease
- b) Symptom of a disease
- c) Environmental condition associated with a disease
- d) Is a physical agent that transmits disease

6. Which of the following things cause malaria?

- a) Female anopheles mosquitoes
- b) Plasmodia (singular plasmodium)
- c) Red blood cells
- d) Culex mosquitoes

7. 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

8. The prime cause of illness resulting in death in the poor countries of the tropical and subtropical regions today is \_\_\_\_\_

- Cholera
- Pneumonia
- Malaria
- TB

9. Diseases that are due mostly to environmental changes, increased population densities, and pollution that result from modernization in third world nations are referred to as:

- Diseases of poverty
- Diseases of development
- Schistosomiasis
- Enteric diseases

10. In March 2024, an outbreak of measles occurred among employees at Factory J in Mombasa. This group of cases in this specific time and place can be described as a

- Distribution
- Cluster
- Determinant
- Population

11. 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. This is also known as

- Host, vector, and transmission.
- Transmission, host, and environment.
- Host, agent, and environment.
- Organism, transmission, and environment.

12. The finding from this outbreak investigation lead to development of new regulations worldwide for climate control systems. What step does this illustrate?

- Communicate the findings.
- Implement control and prevention measures.

- c) Perform descriptive epidemiology.
- d) Refine the hypothesis.

13. The following methods are used in epidemiology, which one is not?

- a) Public health surveillance and Disease investigation
- b) Publication in scientific journals
- c) Analytic studies
- d) Program evaluation

14. A cohort study differs from a case-control study in that:

- a) Subjects are enrolled or categorized on the basis of their exposure status in a cohort study but not in a case-control study
- b) Subjects are asked about their exposure status in a cohort study but not in a case-control study
- c) Cohort studies require many years to conduct, but case-control studies do not
- d) Cohort studies are conducted to investigate chronic diseases, case-control studies are used for infectious diseases

15. A key feature of a cross-sectional study is that:

- a) It usually provides information on prevalence rather than incidence
- b) It is limited to health exposures and behaviors rather than health outcomes
- c) It is more useful for descriptive epidemiology than it is for analytic epidemiology
- d) It is synonymous with survey

16. The epidemiologic triad of disease causation refers to: (Choose one best answer)

- a) Agent, host, environment
- b) Time, place, person
- c) Source, mode of transmission, susceptible host
- d) John Snow, Robert Koch, Kenneth Rothman

17. Indirect transmission includes which of the following?

- a) Droplet spread
- b) Mosquito-borne
- c) Foodborne

- d) Doorknobs or toilet seats

18. Epidemiology gives ideas on what kind of changes that have occurred in a community over a period of time;

- a) True
- b) False

19. Endemic means that a disease

- a) Is prevalent among animals
- b) Occurs clearly in excess of normal expectancy
- c) Is habitually present in human populations
- d) Affects a large number of countries simultaneously

20. The purpose of a double blind or double masked study is to:

- a) Achieve comparability of treated and untreated subjects
- b) Reduce the effects of sampling variation
- c) Avoid observer bias and sampling variation
- d) Avoid observer and subject bias

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

1. Explain the significance of Herd Immunity in a population, giving examples how it works.
2. Using appropriate examples, show how primary, secondary and tertiary prevention is applied in epidemiology
3. List at least three (4) types of studies that you would find in Descriptive or analytical studies
4. Prevention of disease can be done at population level or based on identified high risk group, briefly explain how this can be achieved in the two groups
5. What does the term "causal relationship" refer to in epidemiology?
6. Differentiate between
  - a. Prevalence and incidence
  - b. Pandemic and endemic

- c. Hyper-endemic and holo-endemic
- 7. Differentiate between pre-clinical and sub-clinical states of a disease
- 8. What is the difference between Attack rate and Incidence rate?

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

- 1. The spread of infectious disease impact other aspects of public health, such as nutrition or mental health (20 marks)
- 2. Explain the importance epidemiology in public health, show how it affects policy and vice versa (20 marks)
- 3. Using a detailed diagram, explains chain of infection occurs and how you can mitigate infection (20 marks)