



Technology for Development

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

**UNIVERSITY EXAMINATIONS (MAIN)  
2021/2022 ACADEMIC YEAR**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS**

**FOR THE DIPLOMA  
IN  
BIOTECHNOLOGY**

**COURSE CODE:** BBD 127

**COURSE TITLE:** FUNDAMENTALS OF BIOSAFETY AND  
BIOSECURITY

**DATE:** 28/04/2022 **TIME:** 8.00 -10.00 AM

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**INSTRUCTIONS TO CANDIDATES**

This paper is divided into three sections, **A B** and **C**, carrying respectively: Multiple Choice Questions (**MCQs**), Short Answer Questions (**SAQs**) and Long Answer Questions (**LAQs**). Answer all questions.

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

**SECTION A: Multiple Choice Questions (20 Marks)**

1. The application of combinations of laboratory practices and procedures, laboratory facilities and safety equipments when working with potentially infectious microorganisms is called;
  - A. Risk assesment
  - B. Biosafety
  - C. Containment
  - D. Controlled access zone
2. Which of the following is called **BIOHAZARD**?
  - A. Allergens derived from plants
  - B. Microorganisms
  - C. Toxins derived from bacteria
  - D. A, B and C
3. Which of the following is **TRUE** about PPE (Personal Protective Equipments)?
  - A. It is a form of primary containment
  - B. It may form the primary barrier between a worker and bioharzadous material
  - C. Types may include sealed centrifuge, gloves and hand washing
  - D. An and B
4. Containment may be achieved through:
  - A. An action or series of actions taken to recognize and identify hazards
  - B. Combining good laboratory, safety equipment and facility
  - C. Effective vaccination and antibiotic treatment
  - D. Reducing the number of organisms, it takes to cause disease or illness in a person
5. Microbial agent possessing this route of transmission have caused the most laboratory acquired infections
  - A. Aerosols
  - B. Ingestion
  - C. Parenteral
  - D. Zoonosis
6. Microorganisms with an ability to survive over time and in a variety of environment have a high
  - A. Concentration
  - B. Infectious dose
  - C. Stability
  - D. Route of transmission
7. The product of applying safe methods of managing infectious materials in the laboratory environment where they are being handled or maintained, in order to reduce or eliminate exposure of laboratory workers, other persons and the outside environment to potentially hazardous agents is called
  - A. Biosafety
  - B. Containment
  - C. Decontamination
  - D. Risk assesment
8. Mouth pippeting is allowed
  - A. If you have proper training
  - B. When working with well characterized agents
  - C. Never
  - D. B and C
9. Secondary containment provides protection to the environment external to the laboratory through a combination of facility design and operational practices. An example of secondary containment could be:
  - A. Separation of laboratory work area from public area
  - B. A and C
  - C. Hand washing facilities
  - D. Keep laboratory doors open
10. Work surfaces should be contaminated
  - A. Daily if you work with a BSL-1 laboratory

- B. Daily if you work with a BSL-2 laboratory
  - C. After a spill
  - D. All of the above
11. Which of the following may be placed in a regular waste stream?
    - A. An unwrapped, unused syringe
    - B. Autoclaved biohazard waste
    - C. Clean, broken glass
    - D. None of the above
  12. When working with infectious biological material, the best place to perform the work would be:
    - A. In Biological safety cabinet
    - B. On a laboratory bench
    - C. On a clean bench wearing a dust mask
    - D. In an incubator
  13. The acronym HEPA (as in HEPA filter) stands for;
    - A. High efficient particulate air
    - B. High energy particles in air
    - C. High evaluation protection
    - D. Hepatitis A
  14. Which of the following practices are not allowed in the laboratory;
    - A. Eating and drinking
    - B. Applying cosmetics
    - C. Handling contact lenses
    - D. All of the above
  15. The following are elements of containment
    - A. Laboratory practice and technique, safety equipments, facility design
    - B. Containment, secondary barrier
    - C. Agent stability and pathogenicity
    - D. Mouth Pippeting and hand washing
  16. Liquid biohazard waste may be decontaminated by using;
    - A. 70% ethanol for 30 mins
    - B. A disinfectant and time specific for the biological material you have
    - C. 10% bleach for 30 mins
    - D. Use germicide
  17. .... warning symbol must be displayed on the doors of the rooms where microorganisms of Risk group 2 or higher Risk groups are handled
    - A. STOP sign
    - B. BIOHAZARD sign
    - C. Danger sign
    - D. Highly infectious sign
  18. Which of the following involves preventing the accidental transmission of disease in the laboratory?
    - A. Biosafety
    - B. Biosecurity
    - C. Risk assesment
    - D. Containment
  19. Ensuring that biological materials are locked up and only available to authorized personnel is one aspect of .....
    - A. Containment
    - B. Biosecurity
    - C. Secondary containment
    - D. Biosafety
  20. What includes in Biosafety level 1?
    - A. Respiration protection is required
    - B. Full body suit
    - C. Biological safety cabinet
    - D. Laboratory coat, gloves

**SECTION B: Short Answer Questions (40 Marks)**

1. Highlight benefits of biomedical waste management (8mks)
2. Briefly discuss eight operational practices for laboratory (8mks)
3. Discuss **FOUR** methods used to sterilize materials in a laboratory(8mks)
4. Describe secondary barriers in Biosafety (8mks)
5. Explain donning and doffing of PPE (8mks)

**SECTION C: Long Answer Questions (60 Marks)**

1. Discuss the three elements of containment(20mks)
2. Describe factors that affect risk assessment for acquiring a laboratory associated infection (20mks)
3. Discuss factors that biosecurity plan should address (20mks)