



*(University of Choice)*

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

**(MAIN CAMPUS)**

**UNIVERSITY EXAMINATIONS  
2018/2019 ACADEMIC YEAR**

**FOURTH YEAR SECOND SEMESTER  
END OF SEMESTER EXAMINATIONS**

**FOR  
THE BACHELOR OF SCIENCE IN  
MEDICAL LABORATORY SCIENCES/ BIOTECHNOLOGY  
(DIRECT ENTRY AND UPGRADING)**

**COURSE CODE: BML 423**

**COURSE TITLE: EXPERIMENTAL ANIMAL SCIENCE**

**DATE: 22<sup>ND</sup> MAY 2019**

**TIME: 3.00 -5.00 PM**

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**INSTRUCTIONS:**

**ANSWER ALL QUESTIONS IN SECTION A, B AND C**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination  
cheating

This Paper Consists of 6 Printed Pages. Please Turn Over

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

1. Which one of the following is the least significant section of an animal house
  - (a) Reception area
  - (b) Entertainment room
  - (c) Quarantine room
  - (d) Store room
  
2. A zoonosis cannot
  - (a) Be exemplified by anthrax
  - (b) Be transmitted from an animal to a human
  - (c) Be ignored as an important public health concern
  - (d) Is associated with an overexpression of thromboplastinogen
  
3. The mouse strain referred to as BALB/c
  - (a) Is an outbred albino
  - (b) Has genetic variability
  - (c) Is immunodeficient
  - (d) Has variations in cellular volume of the red blood cell population
  
4. The armadillo
  - (a) Is mainly found in South America
  - (b) Is resistant to *Mycobacterium*
  - (c) Was crucial in the *Influenzae* vaccine development
  - (d) Is easily domesticated
  
5. In the world of animal science
  - (a) One million vertebrates are used every year in experimentation
  - (b) There is tighter regulation in the US compared to the UK
  - (c) Behavioural research and toxicology are the main areas of research
  - (d) The British Royal Society have been opposing animal experimentation
  
6. Animal house corridors
  - (a) Need to be wider than animal chambers

- (b) Need to have well designed steps for passage
- (c) Should be long if the traffic is big.
- (d) Should permit movement of animals

7. Which one of the following is most important to consider when selecting cages for animals

- (a) Animal size
- (b) Economy
- (c) Caging time
- (d) Disease transmission

8. The shoe box cage

- (a) Is least commonly used
- (b) Is not suitable for guinea pigs
- (c) Should have a slip tray insert above it
- (d) Is rectangular and is made of metal grid walls

9. Which one of the following statements is UNTRUE

- (a) Animal water bottles can be of any size as long as they are leakage-proof
- (b) Drinking tubes are best made from stainless steel
- (c) Air bubbles should move up the bottle as the water is drawn
- (d) Automatic devices for water delivery can be very problematic

10. In the feeding of laboratory animals

- (a) Food is generally provided in the form of pellets
- (b) Quality is more important than quantity
- (c) Animal fouling on food should be controlled by animal handlers
- (d) Wet foods should be provided in plastic bowls

11. An example of an aquarium accessory is

- (a) Painting equipment
- (b) Tube exchanger
- (c) Rubber filter
- (d) Heating unit

12. In the filtration of aquaria contents

- (a) The use of pumps is not recommended as it can disturb fish
- (b) Aquaporin 1 Should be added as a growth ingredient
- (c) An undergravel filter should only be used if there is no aerator pump
- (d) Complex filters should be hooked over the tank rim

13. Plastic aquaria

- (a) Are not suited for busy labs
- (b) Are best for small culture work
- (c) Should preferable have chromium framework
- (d) Cannot deteriorate in optic qualities

14. *Elodea canadensis*

- (a) Can overgrow
- (b) Likes strong illumination
- (c) Propagates well by cuttings
- (d) Requires strong germinal centers

15. A bog terrarium

- (a) Is more suitable for slugs
- (b) Should have an acid layer foundation
- (c) Should have a moistened mixture of sand and gravel
- (d) Needs sand humus and gravel in equivalent ratios

16. The Sprague Dawley rat

- (a) Is albinic
- (b) Was generated in philadelphia
- (c) Originated from *Mus musculus*
- (d) Yielded the CFN sub-strains of Carworth

17. *Oryctolagus cuniculus*

- (a) Is classified together with *Sylvilagus*
- (b) Has Can be placed in the same category as the otter and weasel
- (c) Can be reared together with *Felis catus*

(d) Is unsuitable for immunology experiments

18. An example of a 'dirty' area in an animal houses is

- (a) The engineer's room
- (b) The corridor
- (c) Animal rooms
- (d) Equipment store room

19. For easy identification of animals one can use

- (a) Amputation of toes
- (b) Fur powdering
- (c) Leg notches
- (d) Castration

20. Identify the UNTRUE statement among the following

- (a) Conventional animal house duties are done where no research programmes are being undertaken
- (b) Are rarely carried out in animal house rooms of college animals
- (c) Are not critical of SPF units
- (d) Are more important for caged rather than penned animals

**SECTION B: SHORT ANSWER QUESTIONS [40 MARKS]**

1. Outline the advantages and disadvantages of the pen system in animal maintenance **(8 marks)**
2. Discuss the process of filtration in relation to proper aquarium maintenance **(8 marks)**
3. Outline how specific pathogen free (SPF) animals can be obtained for use in experiments **(8 marks)**
4. Outline the features of hamsters used in biomedical research **(8 marks)**
5. Outline the arguments put forward by the following organizations with regard to animal research
  - a. The British Royal Society and The Institute of Lab. Animal Research **(4 marks)**
  - b. BUAV and PETA **(4 marks)**

**SECTION C: LONG ANSWER QUESTIONS [40 MARKS]**

1. Discuss the major considerations in the maintenance of an SFP unit **(20 marks)**
2. Discuss the use of mice in animal science and the major strains of mice used in animal model-based investigations **(20 marks)**