



**KISII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS**  
**FOURTH YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF**  
**BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES**  
**FIRST SEMESTER, 2024/2025**  
**(AUGUST, 2025)**

**MELS 173: LABORATORY ANIMAL SCIENCE**

**STREAM: Y4 S1**

**TIME: 2 HOURS**

**DAY: MONDAY, 9:00-11:00 AM**

**DATE: 18/08/2025**

**INSTRUCTIONS:**

- 1. Do not write anything on this question paper.***
- 2. Answer ALL questions in Section A and in Section B. Answer question ONE (Compulsory) and any other question in section C.***

**SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION (20 MARKS)**

- The following consideration is ideal in laboratory animal selection criteria for experimentations:
  - Quantity
  - Quality
  - Nutritional requirements
  - Human resource
- Laboratory animal committee membership includes the following except:
  - Reinforcement officer
  - Veterinary officer
  - Laboratory officer
  - Community member
- Which of the following is not the best practices in animal care and use protocol?
  - Income generation activity in the lab department
  - Purpose and proposed use lab animals
  - Species justification in experimentation
  - Availability and appropriate use of lab animals
- Which of the follow route of drug administration to laboratory animals is not prescribed?
  - Oral
  - Rectal
  - Gavage
  - None of the above

5. The best needle gauge recommended for intramuscular route for drug administration for hamster in experimental science is:
  - A. 25
  - B. 18
  - C. 20
  - D. 30
6. What is hybrid in experimental laboratory animal science?
  - A. Mating between a brother and a sister
  - B. Relationship of a common ancestor
  - C. A mixture of two or more pure breed
  - D. A cross between two inbred strains
7. Experimental laboratory animal welfare is best explained as:
  - A. External and internal assurance of humane treatment of laboratory animal
  - B. Open interpretation of experimental animal use
  - C. Isolation of germfree associated fauna and flora of animals
  - D. Use of animal models in experimentation
8. Which is the relative floor area size requirement in case of rats in a laboratory cages?
  - A. 15 square inches
  - B. 40 square inches
  - C. 30square inches
  - D. 50 square inches
9. Which of the following is the Typical maintenance diets for rats and mice for growth?
  - A. 17% to 19% protein and 7% to 11% fat
  - B. 14% protein and 4%
  - C. 7% protein and 11% fat
  - D. 10% protein and 15% fat
10. Microenvironment of experimental animal science in laboratories include the following except:
  - A. Humidity
  - B. Temperature
  - C. Gases
  - D. Water
11. Which of the following demonstrates the various methods accepted as humane ways of killing laboratory animals?
  - A. Use of Carbon Dioxide - CO<sub>2</sub>
  - B. Decapitation
  - C. Cardiac arrest using saturated Potassium chloride – KCL
  - D. All of the above
12. To explain the fundamental concepts of Housing, the following terminologies are used except:
  - A. Caging
  - B. Housing Systems
  - C. Laboratory animals' environment
  - D. None of the above
13. To Explain the concepts of in animal experimentation, the following cannot be a preventive measure to laboratory animal:
  - A. On job training in case of newly recruited staffs
  - B. Regular feeding program updates
  - C. Monitor and evaluate animal behavior

- D. Inbred practices
14. Which of the following is not the key element in selection of animal use in experimentation?
- A. Size
  - B. Species
  - C. Use
  - D. None of the above
15. Which of the following can interfere with the normal physiological, behavioral or anatomical integrity of the animal?
- A. Diet
  - B. Electrical stimulation
  - C. Cross-breed
  - D. Light conditions
16. Which of the following explains the fundamental concepts of Hazards?
- A. Physical,
  - B. Chemical,
  - C. Biological
  - D. All of the above
17. Special facilities and safety equipment are needed to protect the animal care and investigative staff like:
- A. limited access to authorized personnel
  - B. Maintenance by trained personnel
  - C. Patient care
  - D. All of the above
18. An effective occupational health and safety program ensures the following
- A. Risks associated with the experimental use of animals are reduced to acceptable levels.
  - B. Allows manipulations of experiments
  - C. Protect animal cross breeds
  - D. Produce hybrid animals
19. Laboratory animal housing should be protected against the following
- A. Noise pollution
  - B. Bad weather with proper ventilation
  - C. Predators
  - D. All of the above
20. Which of the following is not a requirement when handling laboratory animals?
- A. Personnel trained regarding zoonosis,
  - B. Proper feeding program
  - C. Chemical safety training
  - D. Age and sex of working persons

**SECTION B: ANSWER ALL QUESTIONS IN THIS SECTION 20 MARKS**

1. State any five elements for safety and health status in laboratory animal science. (5 marks)
2. List five guidelines used to select experimental laboratory animals. (5 marks)
3. Highlight briefly the functions of a manager in animal science. (5 marks)

4. Explain briefly the applications of 3Rs in experimental laboratory animal science. (5 marks)

**SECTION C: ANSWER QUESTION (ONE)-Compulsory AND ANY OTHER IN THIS SECTION 30 MARKS**

- 1) Describe in details the steps involved to ensure the comfort and well-being of laboratory animals (15 marks)
- 2) Discuss in details requirements to be considered to construct laboratory animal house (15 marks)
- 3) Explain the fundamentals used in handling experimental laboratory animal science (15 marks)