



TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES  
DEPARTMENT OF MEDICAL SCIENCES  
UNIVERSITY EXAMINATION FOR:  
BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES  
AML4401 : EXPERIMENTAL ANIMAL SCIENCE  
END OF SEMESTER EXAMINATION  
SERIES: DECEMBER 2016  
TIME: 2 HOURS  
DATE: 5 Dec 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No Section(s). Attempt ALL questions.

Circle the correct answer in section A.

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SECTION A

1. Which of the following agents can female guinea pigs transmit to their offspring during parturition, resulting in congenital conjunctivitis?
  - a. *Corynebacterium diptheriae*
  - b. *Histoplasma capsulatum*
  - c. *Chlamydia spp.*
  - d. *Rickettsia mooseri*
  - e. *Toxoplasma spp*
  
2. Which of the following species of Pneumocystis can be found in rats?
  - a). *P. carinii*
  - b). *P. wakefieldiae*
  - c). *P. murina*
  - d). *P. jirovecii*
  - e). *Streptococcus spp*
  
3. Which of the following factors IS NOT required to calculate the sample size necessary to detect a statistically significant effect?

- a). The size of the effect under study (difference between experimental groups)
  - b). The population standard deviation of the effect
  - c). The desired power of the experiment to detect the effect (usually 80 to 95%)
  - d). The incidence of laboratory error when measuring the effect
  - e). The hypothesis
4. Which of the following strains of mice is prone to suffering audiogenic seizures?
    - a. BALB/c
    - b. FVB
    - c. 129
    - d. DBA/2
    - e. CB57
  5. Which of the following is FALSE with respect to *Corynebacterium kutscheri*?
    - a. It is a Gram-negative bacillus
    - b. It can infect mice, rats, guinea pigs
    - c. It can be harboured as an inapparent infection in the absence of concurrent disease
    - d. Lesions most frequently occur in the lungs
    - e. It is a Gram-positive bacillus
6. Which of the following disinfectants is capable of inactivating mousepox?
    - a. 10% N NaOH
    - b. 0.5% chlorhexidine
    - c. 70% isopropyl alcohol
    - d. 2% phenolic acid
    - e. Hot water
  7. Mouse Thymic Virus is a...?
    - a. Adenovirus
    - b. Polyomavirus
    - c. Herpesvirus
    - d. Pneumovirus
    - e. Chikungunya virus
  8. Which are the blood vessels typically used for positioning long-term peripheral venous cannulae in swine?
    - a. Jugular
    - b. Saphenous
    - c. Cephalic
    - d. Mammary
    - e. Femoral vein

9. Which of the following describes minute volume when ventilating a laboratory animal?
- The amount of gas delivered in a single breath
  - Tidal volume multiplied by respiratory rate
  - The total amount of gas present within a nonrebreathing anesthesia circuit
  - Tidal volume multiplied by the inspiratory flow rate
  - The amount of gas delivered in a double breath
10. Which of the following is used as a mutagen for phenotype-driven mutagenesis in laboratory mice?
- Cre
  - ENU
  - loxP
  - TNF
  - Necrosis factor
11. Which structure of the brain is lacking in fish compared to mammalian species?
- Neocortex
  - Pituitary gland
  - Hypothalamus
  - Brain stem
  - Lung stem
12. Which of the following statements applies when performing immersion anesthesia in amphibians?
- When tricaine methane sulfonate is dissolved in dechlorinated water, it forms a caustic alkaline solution
  - All solutions of MS-222 should be buffered before use
  - Benzocaine is less potent than MS-222 but has a greater margin of safety
  - Isoflurane is the preferred agent for amphibian immersion anesthesia
  - Ketamine
13. Mouse Adenoviruses are?
- Noneveloped RNA viruses
  - Nonenveloped DNA viruses
  - Enveloped DNA viruses
  - Retroviruses
  - Enveloped RNA virus
14. Which of the following best describes the mode of inheritance of congenital glaucoma (buphthalmia) in rabbits?
- Autosomal dominant with incomplete penetrance
  - Sex-linked recessive with complete penetrance
  - Autosomal recessive with incomplete penetrance
  - Autosomal dominant with complete penetrance

- e. DNA linked
15. Citrobacter spp. can be readily isolated on which of the following agars?
- a. Sheep blood
  - b. MacConkey
  - c. Chocolate
  - d. Monkey blood
  - e. Rabbit blood
16. Which of the following is the official definition of a HEPA filter?
- a. A filter that filters 99.00% of particles measuring 0.5  $\mu\text{m}$  in diameter
  - b. A filter that filters 97.00% of particles measuring 0.3  $\mu\text{m}$  in diameter
  - c. A filter that filters 99.97% of particles measuring 0.5  $\mu\text{m}$  in diameter
  - d. A filter that filters 99.97% of particles measuring 0.3  $\mu\text{m}$  in diameter
  - e. A filter that filters 89.97% of particles measuring 0.2  $\mu\text{m}$  in diameter
17. Which of the following species is the most resistant to the effects of exogenous steroids?
- a. Guinea pigs
  - b. Hamsters
  - c. Chinchillas
  - d. Gerbils
  - e. Mice
18. Which of the following agents is a pure agonist?
- a. Naloxone
  - b. Etorphine
  - c. Medetomidine
  - d. Fentanyl
  - e. Buprenorphine
19. Which of the following is the primary means of natural transmission of Lactate Dehydrogenase-elevating Virus
- a. Fighting
  - b. Sexual
  - c. Direct contact
  - d. In-utero
  - e. Inhalation
20. Which of the following organizations assigns laboratory codes to the names of mouse and rat strains?
- a. AALAC
  - b. MGD
  - c. ILAR

- d. FELASA
  - e. KPSA
21. Which of the following is FALSE with respect to ferrets (*Mustela putorius furo*)?
- a. In the wild, they breed twice a year
  - b. The female is light-positive, she comes in season as the day lengthens
  - c. Both males and females show marked seasonal variations in coat and body weight
  - d. The scent of a male can be sufficient for the female to ovulate
  - e. Do not ovulate
22. Which of the following nonhuman primates is known to produce a large percentage of chimeric twins?
- a. *Macaca mulatta*
  - b. *Papio hamadryas*
  - c. *Saimiri sciureus*
  - d. *Cebus capucinus*
  - e. *Cercopithecus mitis*
23. Which of the following *Helicobacters* has been associated with increased hepatocellular tumours in mice?
- a. *Bilis*
  - b. *Muridarium*
  - c. *Hepaticus*
  - d. *Rodentium*
  - e. *H. pylori*
24. Which of the following is the primary excitatory neurotransmitter released by nociceptive terminals?
- a.  $\gamma$ -amino-butyric-acid (GABA)
  - b. Glycine
  - c. Glutamate
  - d. Serotonin
  - e. Morphine
25. Which of the following is FALSE with respect to Rhesus macaques?
- a. They have cheek pouches
  - b. They are a terrestrial and diurnal species
  - c. They are seasonal breeders
  - d. They have a prehensile tail
  - e. They are small
26. Which of the following strains has been used as models of Type I Diabetes mellitus?
- a. Bio-Breeding Rat

- b. Zucker Diabetic Fatty Rat
- c. Brattleboro Rat
- d. Goto-Kakizaki Rat
- e. Mice

27. Which of the following phenomena possibly represents the most common source of genetic variation within rodent colonies?

- a. Spontaneous mutations
- b. Genetic manipulation
- c. Breeding errors
- d. Genetic drift
- e. Gene variations

28. Failure to follow Standard Operating Procedures (SOP) is considered a violation of what standards or guidelines?

- a. Animal Welfare Act
- b. Guide for the Care and Use of Laboratory Animals
- c. Institutional Animal Care and Use Committee Guidebook
- d. Occupational Health and Safety in the Care and Use of Research Animals
- e. Biosafety act

29. Which of the following statements best describes the female rabbit reproductive tract?

- a. Simplex uterus, single cervix
- c. Bipartite uterus, single cervix
- d. Complete medial septum in the body of the uterus
- e. No uterus

30. Use of which of the following anesthetic agents has been associated with hyperglycemia?

- a. Ketamine
- b. Xylazine
- c. Propofol
- d. Pentobarbital
- e. Chloroform

## Section B

- 31. a). Discuss indicators of ill health of laboratory animals (10 marks)
- b). Outline the means of controlling pests in an animal facility (6 marks)
- 32. a). Describe the nutritional requirements of small laboratory animals (18 marks)
- b). Name three laboratory animals and state their importance (6marks)

