2017 International Mock Board Exam Coalition

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Practical Section – 120 Questions without Photos

**30 Pages**

***This examination is meant to be used as a study tool when preparing for the ACLAM or ECLAM Certifying Examinations. The material presented in this mock examination follows the ACLAM role delineation document, but is not necessarily reflective of the ACLAM or ECLAM Certifying Examinations.***

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Question 1: A ferret presents with lethargy, diarrhea and vomiting and then develops a head tilt and ataxia. The animal is euthanized within a few days of presentation due to non-response to supportive care. At necropsy, the following image is observed. What is your primary differential diagnosis?

1. Epizootic catarrhal enteritis
2. Ferret systemic coronaviral disease
3. Rotavirus
4. Canine distemper

Question 2: The equipment depicted in this image is used to measure what parameter?

1. Transepidermal water loss
2. Tumour size and density
3. Heart rate
4. Body temperature
5. Epidermal thickness

Question 3: Which of the following statements best describes the intracage temperature and humidity compared to the macroenvironment when mice are housed in the depicted mouse caging system?

1. The intracage humidity and temperature remain the same as the macroenvironment of the room
2. The intracage humidity and temperature are higher compared to the macroenvironment of the room
3. The intracage humidity is higher and the temperature is lower compared to the macroenvironment of the room
4. The intracage humidity and temperature are lower compared to the macroenvironment of the room

Question 4: The above species is used as a model for what human condition?

1. Male-pattern baldness; males only
2. Male-pattern baldness; both sexes
3. Red-green color blindness; males only
4. Red-green color blindness; both sexes
5. Red-green color blindness; females only

Question 5: Which of the following is considered the most appropriate model for studying biofilm infections using the imaging modality pictured here?

1. Neutropenic mouse thigh
2. Subcutaneous catheter
3. Dermal wound punch
4. Intramedullary pin
5. Surgical mesh

Question 6: The international biohazard warning symbol and sign imaged above must be displayed on the doors of rooms where microorganisms of what risk groups are handled?

a. Risk Group 5 or higher

b. Risk Group 4 or higher

c. Risk Group 3 or higher

d. Risk Group 2 or higher

e. Risk Group 1 or higher

Question 7: The following can be used to perform what technique on mice?

* 1. Tattooing
  2. Tail clipping
  3. Microchip implantation
  4. Ear notching

Question 8: If you examined a ferret with the following clinical signs and associated histological section from the bladder, what would be your most likely diagnosis?

1. Aleutian disease
2. Coccidioides
3. Canine distemper
4. Influenza
5. Mast Cell Tumor

Question 9: The picture represents what type of IVC?

1. intracage supply/perimeter capture
2. intracage supply/intracage exhaust (direct)
3. intracage supply/intracage exhaust (indirect)
4. intracage supply/intracage exhaust (combination)

Question 10: Identify the following species and the research model for which they are frequently used:

* 1. *Mus musculus;* diet-induced type-2 diabetes
  2. *Rattus norvegicus;* diet-induced type-2 diabetes
  3. *Acomys cahirinus*; diet-induced type-2 diabetes
  4. *Peromyscus leucopus;* diet-induced type-2 diabetes
  5. *Phodopus sungorus*; female aggression

Question 11: Several rats of different ages in your colony are reported to be depressed, anorexic, have hunched posture, respiratory rales can be heard, and a few have died. Gross lesions include numerous pale foci 1-5 mm scattered throughout the lung parenchyma as shown in the image. Lesions are centrally liquefied. Histologically, necrotizing lobar pneumonia with fibrinous adhesions is present. What is the most likely causative agent?

1. Ciliary Associated Respiratory bacillus
2. *Streptobacillus moniliformis*
3. *Corynebacterium kutscheri*
4. *Bordetella bronchiseptica*
5. *Streptococus peumoniae*

Question 12: The organisms pictured below was found on the dorsal fin of a goldfish in quarantine. Which of the following would be an appropriate course of action?

1. Isolate the fish and the infection will be self-limiting
2. Treat all water in the facility with chlorine
3. Physically examine each fish and remove organisms
4. Perform skin scrape and euthanize infected fish

Question 13: This gross photograph shows tissues from a Long-Evans rat that died within days after arriving at an animal facility from a commercial breeder. What condition did the rat have and what is depicted in the picture?

1. Urolithiasis; kidney with calculi in the renal pelvis
2. Urolithiasis; urinary bladder with multiple variable sized calculi in the lumen
3. Spontaneous progressive glomerulonephropathy; kidney with granular surface
4. Pulmonary pneumocystosis; lung with focal cellular infiltrates
5. Spontaneous diplococcal (*Streptococcus pneumoniae*) infection; fibrinous pleuritis

Question 14: According to the *Guide*, what is the minimum cage height this animal should be provided?

1. 20 inches
2. 30 inches
3. 40 inches
4. 50 inches
5. 60 inches

Question 15: The above species is currently used for which type of study?

1. DSS induced colitis
2. Multiple sclerosis
3. Human monkeypox
4. Parkinson disease
5. *Hepatitis B* pathogenesis

Question 16: What does this sign indicate?

1. biological hazard
2. chemical hazard
3. explosive hazard
4. radioactive hazard

Question 17: Which of the following pharmaceutical is ideal for analgesic therapy in this species?

1. Morphine
2. Acetaminophen
3. Butorphanol
4. Gabapentin

Question 18: What is the device pictured used for, and what are its advantages?

* 1. Focused Beam Microwave Irradiation; fix brain metabo­lites in vivo while maintaining the anatomic integrity of the brain
  2. Class 1 BSC; provide personnel and environmental protection against low to moderate risk agents
  3. Decapitation Device; means of obtaining anatomically undamaged brain tissue for study
  4. Blue Box: uses ultraviolet irradiation to disinfect surgical instruments

Question 19: What is this piece of equipment used in the colony management of gnotobiotic mice?

a. Bulkhead fitting

b. Filter piping

c. Glove cuff

d. O-ring

Question 20: What is the equipment depicted in the picture above?

1. Cabinet bottle washer
2. Reverse osmosis water purification system
3. Robotic tunnel washing system
4. Automated bottle filler equipment with proportioner

Question 21: A veterinary technician observes the bottom rat in both pictures. After reviewing, you discover it is a 2-year old Fischer 344 rat on a study evaluating effects of a novel treatment on aged myocardium. What is your top differential?

1. Chronic kidney failure
2. leukemia
3. pituitary adenoma
4. heart failure
5. normal rat

Question 22: A pathologist presents the following representative lesion from experimentally naïve, multiple adult C57BL/6 female mice found in your colonies. What test do you perform to rule out your primary differential?

1. Fecal float with iodine stains
2. PCR of the cage microfilter
3. Check ventilated blower flow rate
4. Resection tissues and stain with methenamine silver or PAS

Question 23: Which one of the following correctly describes the life cycle of this parasite?

a. The life cycle is direct and is completed in approximately 23-25 days.

b. The life cycle is indirect and is completed in approximately 23-25 days.

c. The life cycle is indirect and is completed in approximately 12-15 days.

d. The life cycle is direct and is completed in approximately 12-15 days.

Question 24: What is the genus of the animal pictured below and what is it a model for?

* 1. *Aotus*; Rh Factor
  2. *Chlorocebus;* Vero cells
  3. *Saimiri*; Pelvic organ prolapse
  4. *Aotus*; Vision research

Question 25: What is this device?

1. Rodent restraint device
2. Test tube holder
3. Filter holder
4. Feed follower
5. Centrifuge

Question 26: A recent article described several 2-step euthanasia methods for this species. Which method was found to meet welfare and scientific requirements?

a. Immersion in reverse osmosis purified water followed by 10% formalin

b. Immersion in flat beer followed by 10% formalin or 70-90% ethanol

c. Immersion in ice water followed by 10% formalin or 70-90% ethanol

d. Immersion in 70% ethanol followed by 10% formalin

Question 27: What organization utilizes this emblem?

a. AAALAC International

b. International Air Transport Association

c. Occupational Safety and Health Administration

d. People for the Ethical Treatment of Animals

Question 28: What is the purpose of the Lixit piece indicated as A?

1. prevent the rodent’s upper lip from being trapped in the lixit
2. spring mechanism for maintaining proper water pressure in valve
3. to prevent rodent from pulling the stem of the lixit out
4. to inhibit rodents from stuffing bedding into the lixit

Question 29: It’s Friday afternoon and the vet tech calls you in to look at hair pluck sample from sentinel mice. She is concerned about what appears to be an adult arthropod in the sample. What is the organism?

a. *Radfordia ensifera*

b. *Myocoptes musculinus*

c. *Tyrophagus putrescentiae*

d. *Myobia musculi*

Question 30: Which of the following is **TRUE** regarding the apparatus pictured?

1. It is a two-chamber paradigm test known as Crawley's sociability and preference for social novelty protocol
2. It is used to study social interaction and social memory in inbred and mutant mouse lines
3. It assays activity, locomotor, and anxiety-related effects of neurobiological manipulations
4. It is used to evaluate development and metabolic intake and output
5. It is used to test learning and memory in which mice learn to associate a context and a cue with an unconditioned stimulus

Question 31: According to ***AVMA Guidelines for the Euthanasia of Animals: 2013 Edition***, which method of euthanasia for species depicted in the picture is **Acceptable with Condition**?

1. Barbiturates (alternate routes)
2. Immersion in isoflurane
3. Rapid chilling
4. Clove oil
5. Maceration

Question 32: What is the pictured device and what is it used for?

1. Visual cliff, a test to assess vision and depth perception
2. Balance beam, a test to assess motor coordination and balance
3. Elevated plus-maze, a test to measure anxiety-like behavior
4. Rotarod, a test to assess motor coordination and balance

Question 33: When administered as shown, this common analgesic has been associated with severe respiratory depression, hypothermia, bradycardia and unresponsiveness. These effects can be reversed using:

1. Atipamezole
2. Flumazenil
3. Naloxone
4. Yohimbine

Question 34: Name the anatomical zero point on the skull for the coordinate system marked with letter A in the atlas depicted in the picture.

1. Bregma
2. Lambda
3. Sagittal Sutures
4. Interaural line

Question 35: What is this apparatus?

1. A unit used to collect urine and feces from study animals
2. An inhalation chamber
3. A unit for housing poultry
4. A mechanical washer for fragile equipment

Question 36: This species has what unique husbandry requirement?

a. Monthly dust baths

b. Weekly dust baths

c. Daily dust baths

d. Daily water bath

Question 37: An infant mouse presented with lethargy, a bloated abdomen and fecal soiling of the perineum. Histology of the intestines is presented below. What disease caused the clinical and histological signs?

1. Mouse Hepatitis Infection
2. Mouse Parvovirus Infectiom
3. Mouse Rotavirus Infection
4. Tyzzer’s disease

Question 38: What is this equipment used to measure?

a. Fear-aggression

b. Anxiety

c. Learned helplessness

d. Motor function

Question 39: This device is used to aid:

a. UV sterilization

b. Behavioral studies

c. Filtration of toxins

d. Embryo collection

Question 40: Which of the following statements about the device depicted in the following image is **CORRECT?**

1. It requires the use of jackets, restraint devices or tethering systems
2. It can be maintained for a maximum of 14 days, depending on the species
3. It provides continuous delivery to ensure constant compound levels in plasma or tissues for maximized therapeutic efficacy and reduced adverse effects
4. It provides a convenient, reliable, and cost-effective alternative to chronic injections
5. It can be placed intravascularly to monitor blood pressure, temperature, and activity from acceleration

Question 41: When utilizing the agent depicted below to anesthetize *Xenopus spp.*; which of the following **IS NOT** required?

1. Powder must be dissolved in water
2. Solution must be sterile filtered prior to use
3. Powder must be handled under a chemical fume hood
4. Solution must be buffered prior to use
5. Solutions must be stored in a cool place away from light

Question 42: The picture below illustrates the blood smear of a macaque recently acquired from an institution in the south of United States. The following statement is false about the parasite depicted below:

a. Parasitemia can be transient which may cause false negative results.

b. In chronic disease, viable organisms can be detected frequently in tissue sections.

c. Clinical signs are not specific and include lethargy, anorexia, and depression.

d. Clinical signs are usually secondary to cardiovascular involvement.

Question 43: The following zebrafish parasite can be effectively treated with:

1. Salt baths
2. Fenbendazole
3. Chloroquine
4. Fumagillin

Question 44: This OSHA chemical hazard pictogram indicates that a chemical has the following toxicities **EXCEPT**

* 1. Target organ toxicity
  2. Respiratory sensitizer
  3. Skin sensitizer
  4. aspiration toxicity
  5. carcinogen

Question 45: In anesthetized dogs, rabbits, and swine, the location shown above can be used to measure heart rate and which of the following important parameters, using which device:

1. PaO2 using a pulse oximeter
2. SaO2 using a pulse oximeter
3. PaCo2 using a pulse capnometer
4. SaCo2 using a pulse capnometer
5. SaO2 using a pulse capnometer

Question 46: The device next to the paperclip is used for:

a. Measuring pain threshold in rodents

b. Nonpharmacologic pain control

c. Single cell recording in electrophysiology studies

d. Performing root canals

Question 47: What is the purpose of this piece of equipment?

a. Sanitizing equipment

b. Dispensing bedding

c. Scavenging anesthesia

d. Protecting employees from hazards

Question 48: These images are from a necropsy of a rat that was purchased from a pet store for comparison of pathogen profiles in pet versus laboratory reared rats. What is the suspected etiology?

a*. Trichosomoides crassicauda*

b*. Rodentolepis nana*

c*. Taenia taeniaformis*

d*. Laelaps echidnina*

Question 49: These two images depict injection of what anatomic structure?

a. Epaxial muscle

b. Dorsal lymph sac

c. Coelom

d. Lateral line

e. Egg mass

Question 50: Which of the following murine microbial agents is most likely to be detected by both dirty bedding sentinels and the method pictured?

a. Mouse hepatitis virus

b. *Pasteurella pneumotropica*

c. Fur mites

d. Sendai virus

Question 51: Which of the following methods would be the safest, least destructive, and most practical and effective choice for environmental decontamination in the face of an outbreak involving this parasite?

a. Dry heat at 215°F for 30 minutes

b. Ethylene oxide gas at 1,200 mg/L for 12 hours

c. Formaldehyde fumigation for 7 hours

d. Chlorine dioxide gas at 1 mg/L for 4 hours

Question 52: The following rodent depicted in the picture, commonly studied for periodontal disease is mainly carnivorous:

a. Geomys

b. Dipodomys

c. Neotoma

d. Oryzomys

Question 53: The apparatus shown below is used in studies evaluating which of the following?

1. Fecal and urinary output
2. Taste aversion
3. Sleep fragmentation
4. Fear response
5. Pulmonary function

Question 54: What does this test assess?

1. Anxiety
2. Learning
3. Depression
4. Motor function

Question 55: The following item is primarily used to reduce and replace research animals for what training purpose?

1. Intravenous injection
2. Suturing or wound closure
3. Tattooing
4. Topical drug administration
5. Surgical site preparation

Question 56: Which of the following is the most likely scenario regarding the generation of these littermate mice?

a. These mice are the result of ENU mutagenesis.

b. The mouse on the far left has the highest contribution of B6 embryonic stem cells injected into a B6 albino blastocyst.

c. These mice are the result of pronuclear injection of B6 DNA into an FVB embryo.

d. These mice are the result of cytoplasmic injection of a CRISPR/Cas nuclease containing B6 DNA into an FVB embryo.

Question 57: The rodent pictured belongs to the family \_\_\_\_\_\_\_ and lives a predominantly \_\_\_\_\_ lifestyle.

* 1. Cricetidae; monogamous
  2. Bathyregidae; eusocial
  3. Neotoma; solitary
  4. Geomyidae; fossorial
  5. Castoridae; aquatic

Question 58: The image shown is a 40X image of necropsy tissue from a *Macaca nemestrina* in Texas. How was the infectious organism shown here transmitted to this animal?

* 1. *Aedes* spp.
  2. *Anopheles* spp.
  3. *Culex* spp.
  4. *Triatoma* spp.

Question 59: What is **TRUE** about this animal’s use in neurobehavioral research?

1. This animal is more sensitive to MTPT administration than the rhesus macaque
2. This animal is the preferred animal model of experimental allergic encephalitis (EAE) compared to the cynomologous and rhesus macaque
3. This animal is used to model the neuropathogenesis of lentiviruses such as HIV
4. The first transgenic Huntington’s disease model was developed in this species

Question 60: The multimodal imaging shown is being used to study the evolution and growth of \_\_\_\_\_\_\_.

a. xenografts

b. osteoarthritis

c. heart failure

d. reproduction

Question 61: According to the Animal Welfare Regulations, this animal, weighing 22 kg, requires which cage size?

1. Group 3
2. Group 4
3. Group 5
4. Group 6

Question 62: The organisms seen here are associated with

1. Rectal prolapse and enteritis in Rag1-/- mice.
2. Zoonotic transmission from pet store rodents to humans
3. Hypersensitivity dermatitis in B6 background strains
4. Bronchiolitis and bronchitis from pulmonary pneumonyssiasis

Question 63: Which etiologic agent, depicted below in a photomicrograph of a ventral nerve, may be associated with clinical signs of emaciation and spinal deformities in zebrafish (*Danio rerio)*?

1. *Pseudoloma neurophilia*
2. *Pseudocapillaria tomentosa*
3. *Pleistophora hyphessobryconis*
4. *Myxidium streisingeri*
5. *Lecythophora mutabilis*

Question 64: Which of the following chicken (Gallus domesticus) husbandry items shown in the first picture below would be a likely cause for the pulmonary hemorrhage and liver necrosis shown in the second set of histology slide pictures below?

1. New Polyethylene Terephthalate (PET) water bottles
2. Old Polyethylene Terephthalate (PET) water bottles
3. Noncoated, non-shatter-proof heat-lamp bulbs
4. Polytetrafluoroethylene (PTFE)- coated, shatter-proof heat-lamp bulbs

Question 65: The device pictured above is used for what application?

a. Operant-based pain assay

b. Memory testing

c. Metabolic chamber

d. Fear conditioning

e. Agility measurements

Question 66: In the U.S. what controlled substance schedule is this anesthetic classified as?

1. Schedule 1
2. Schedule II
3. Schedule III
4. Schedule IV
5. Schedule V

Question 67: What is the most likely diagnosis of the spontaneous eye lesion depicted below?

1. Unilateral cataract
2. Bilateral anophthalmia
3. Unilateral Enophthalmos
4. Horner’s syndrome

Question 68: According to both the Animal Welfare Act and the Guide, what is the minimum floor space requirement for the primary enclosure of a three kilogram animal of the pictured species?

1. 1.6 ft2
2. 3 ft2
3. 4.3 ft2
4. 6 ft2
5. 8 ft2

Question 69: Which of the following is a characteristic of the device pictured?

1. It can deliver room air through an anesthetic circuit.
2. The risk of barotrauma is reduced by internal manifolds.
3. Inspiratory:expiratory ratio cannot be adjusted when it is running.
4. It will compensate for leaks in the anesthetic circuit, but an increase in the patient’s airway resistance will result in decreased tidal volume delivered.
5. It can operate in either intermittent positive-pressure or high-frequency mode.

Question 70: This is an example of enrichment commonly used for what species?

a. Dogs

b. Cats

c. Primates

d. Primates and Cats

e. Cats and Dogs

Question 71: Light exposure below what intensity at cage level might have prevented formation of the lesion in this rat?

a. 650 lux

b. 575 lux

c. 400 lux

d. 325 lux

Question 72: How would you evaluate the following picture of a rat using the rat grimace scale?

1. Moderate orbital tightening and moderate nose/cheek flattening.
2. No orbital tightening and no nose/cheek flattening.
3. Obvious orbital tightening and moderate nose/cheek flattening
4. Moderate orbital tightening and no nose/cheek flattening

Question 73: You are verifying that environmental noise in your newly constructed facility meets the needs of an investigator using a mouse strain prone to audiogenic seizures. What is the following instrument’s use in this process?

1. An ultrasonic frequency detector to determine if ultrasound is present
2. A decibel detector to ensure that noise levels meet OSHA standards
3. A vibration detector to ensure that equipment doesn’t produce undue motion in cages
4. A frequency transducer that converts ambient noise to a standard score

Question 74: Which is considered an unacceptable method of euthanasia for this species according to the AVMA Guidelines for the Euthanasia of Animals?

1. Cervical Dislocation
2. Decapitation
3. Thoracic Compression
4. Nitrogen and Argon
5. Inhaled Anesthetics

Question 75: Which of the depicted species has been use consistently as a robust rodent model of human respiratory syncytial virus (RSV)?

a.

b.

c.

d.

Question 76: Which species is most likely to experience acute death when affected by the disease pictured above?

1. Oryctolagus cuniculus
2. Cavia porcellus
3. Meriones unguiculatus
4. Rattus rattus

Question 77: The photomicrograph below shows an H&E stained section of the right ventricular myocardium and epicardium in a BALB/c mouse. On gross examination, the lesion appeared as white plaques on the surface of the heart. What condition is shown and what special stain should be used to confirm the diagnosis?

1. Cardiac amyloidosis, PAS stain
2. Cardiac mineralization, Von Kossa stain
3. Cardiac amyloidosis, Congo red stain
4. Cardiac mineralization, Alcian blue stain

Question 78: In the photograph below, the urinary bladder in this mouse is greatly distended with reddish urine. What is the light-beige cystic structure to the left of the tail at the bottom of the photograph?

1. A cystic bulbourethral gland
2. A cystic preputial gland
3. A cystic sebaceous gland
4. A cystic coagulating gland
5. A cystic urethral gland

Question 79: Which of the following best describes the surgical model pictured below?

1. The ileal conduit model, commonly performed in *Sus scrofa*, is a model for the evaluation of radiochemotherapy or molecular-based therapies in bladder cancer following radical cystectomy.
2. The reversible intestinal tie-adult rabbit diarrhea (RITARD) model provides for the chronic evaluation of induced infectious gastrointestinal disease typically evaluating *Escherichia coli*.
3. The ileal loop model in *Oryctolagus cuniculi* provides for the evaluation of acute gastrointestinal disease and is typically used as a model for *Vibrio cholerae*.
4. Serial transverse enteroplasty (STEP) is a method of short bowel syndrome surgical correction typically refined in *Sus scrofa* models.

Question 80: The image shows an appropriate identification method for what species?

a. Dog

b. Cat

c. Primate

d. Dogs and cats

e. Dogs, cats, and primates

Question 81: What does the equipment depicted below measure?

1. Depression
2. Memory
3. Avoidance
4. Mechanical allodynia
5. Rotational behavior

Question 82: According to the AWA and Regulations, which of the following cannot be used to sanitize primary enclosures for the following species?

1. Soap or detergent and hot water - 180 °F in a mechanical cage washer
2. Detergent solution followed by a safe disinfectant
3. Live steam
4. Flame
5. Wash and rinse water at 143 - 165 °F for 30 minutes

Question 83: According to the *Guide for the Care and Use of Agricultural Animals in Research and Teaching, which of the* following illumination settings is recommended for this species in this type of housing?

1. 320 lux
2. 120 lux
3. 220 lux
4. 220 ft. candles
5. 25 ft. candles

Question 84: Which of the following would be an inappropriate bedding substrate for this model?

1. Aspen
2. Beech
3. Maple
4. Birch
5. Pine

Question 85: Fecal examination of a male *Mesocricetus auratus* revealed the organism below. Which of the following best describes the organism and an appropriate intervention strategy?

1. *Trichosomoides crassicauda* is commonly found in wild rats and enhanced vermin control is needed.
2. *Hymenolepis diminuta* has an indirect lifecycle and the animal must be treated with praziquantel.
3. *Dentostomella translucida* has a direct lifecycle in this species and the animal must be treated with piperazine citrate.
4. *Rodentolepis nana* has a direct lifecycle and all animals must be culled due to its zoonotic potential.
5. *Prosthenorchis elegans* can be identified with fecal sedimentation and the animal should be treated with carbon tetrachloride.

Question 86: Rats housed in this style of cage have been reported to have an increase in which of the following parameters in comparison to individuals housed in clear cages?

* 1. Nocturnal melatonin
  2. Xenograft growth
  3. Diurnal total fatty acids
  4. Lactate

Question 87: Which U.S government agency enforces international agreements with the following agency?

1. Department of Interior
2. Department of Agriculture
3. Department of Commerce
4. Department of Health and Human Services
5. Department of Transportation

Question 88: According to the standard pattern for ear notches punch numbering, what is the number of this mouse?

* 1. 12
  2. 21
  3. 32
  4. 23
  5. 51

Question 89: According to USDA *Animal Welfare Regulation*, what is the minimum floor area for the male nonhuman primate species depicted in the slide weigh 20 kg?

1. 1.6 ft.2
2. 3.0 ft.2
3. 4.3 ft.2
4. 8.0 ft.2
5. 10.0 ft.2

Question 90: What is the ideal temperature for the system pictured here?

* 1. 27.4°C
  2. 28.5°C
  3. 30.1°C
  4. 26.2°C

Question 91: This is one benefit from this type of housing for *Danio rario*:

1. Decreased cortisol production for singly housed animals
2. Increased breeding
3. Increased growth rate
4. Increased shoaling behavior
5. Decreased aggression

Question 92: Two photos below are from an adult mouse. What is the likely cause of the pathological changes seen?

1. A lymphoid (B cell) neoplasm
2. A subcutaneous abscess in one of the hind limbs
3. A periorbital abscess
4. A mammary gland neoplasm
5. Infection with *Mycoplasma coccoides*

Question 93: Deficiency of which enzyme produces the gross findings shown above in a guinea pig (*Cavia porcellus*)?

1. L-lactose oxidase
2. L-gulonolactone oxidase
3. L-ascorbate oxidase
4. L-dehydroascorbic oxidase

Question 94: Photo of abdominal contents of a healthy animal after necropsy. The gastrointestinal tract shown is from what species?

1. An herbivorous Old-World monkey because it has a large cecum and sacculus profundus
2. A large rodent because it has a sacculus rotundus and appendix
3. A ferret because it has a sacculus rotundus and fusus coli
4. A rabbit because it has a sacculus rotundus and fusus coli
5. A rabbit because it has a sacculus rotundus and ampulla caecalis coli

Question 95: The following health monitoring method is more efficient than soiled bedding change at detecting which of the following agents that can infect mouse colonies in the research facilities?

a. Mouse hepatitis virus

b. Pasteurella pneumotropica

c. Pinworms

d. Mouse parvovirus

Question 96: The following picture allows visualization of what unique feature about the avian larynx?

a. the syrinx

b. incomplete tracheal rings

c. median tracheal septum

d. the lack of an epiglottis

Question 97: Which of the following statements is TRUE regarding the condition pictured above (tissue from a rabbit)?

* 1. Incidence does not seem to bear any relationship to parity
  2. Incidence is related to both increasing age and parity
  3. Metastases are uncommon, but when they do occur are found in the liver and lungs
  4. Metastases are uncommon, but when they do occur are found in the lungs and axial skeleton

Question 98: Which of the following organisms can transmit the rat tapeworm *Hymenolepis diminuta*?

a. 

b.

c.

d.

Question 99: Slowly filling euthanasia chambers with fixed rates of carbon dioxide as indicated in the newest guidelines, in mice has been shown to induce the following lesion in which of the following strains of mice?

a. C57BL6

b. SJL

c. BALB/c

d. C3H

Question 100: What is the most likely diagnosis for the 3 month disease progression noted between A and B?

1. Limb girdle muscular dystrophy (type II fiber deficiency)
2. Diffuse idiopathic skeletal hyperostosis
3. Duchenne muscular dystrophy (dystrophin deficiency)
4. Globoid cell leukodystrophy
5. Multiple sclerosis

Question 101: The technique depicted in this slide is a non-surgical refinement of what technique?

* 1. Administration of ENU
  2. Collection of sperm cells
  3. Urinary catheterization
  4. Collection of oocytes

Question 102: Which of the following is the appropriate way to ship a serum sample to be tested for B virus?

1. In package A with identification number UN 2814
2. In package B with identification number UN 2814
3. In package A with identification number UN 3373
4. In package B with identification number UN 3373
5. In package B with identification number UN 2900

Question 103: This is a photo of a spleen from a rabbit. It is relatively small because:

1. Rabbits have a lot of lymphoid tissue in the GALT (Gut-Associated Lymphoid Tissue).
2. Rabbits have a lot of lymphoid tissue in the sacculus rotundus and Peyer’ Patches.
3. Rabbit bones are fragile but all contain abundant lymphoid tissue.
4. The red pulp is diminished because the bones contain abundant erythroid tissue.
5. The thymus gland of rabbits does not regress with age and thusly there is no need for T cells in the splenic white pulp.

Question 104: Which of the following cleaning agents is not safe to use on cages housing the specie depicted in the picture below?

a. 1% Virkon

b. Iodine-based cleanser

c. 2% bleach

d. 70% ethanol

Question 105: What basic behavior does the following enrichment item provide for *Sus scrofa?*

* 1. Rooting
  2. Suckling
  3. Socialization
  4. Sexual

Question 106: This cell, found in guinea pigs, is most prominent during the pregnancy when:

a. As the estrogen level decreases

b. As the progesterone increases

c. As the estrogen level increases

d. As the progesterone level decreases

Question 107: The following lesion in a squirrel monkey (*Saimiri sciureus*) is most likely due to which nutritional imbalance?

1. Hypervitaminosis A
2. Hypovitaminosis D2
3. Hypovitaminosis C
4. Hypovitaminosis D3
5. Folic acid deficiency

Question 108: According to the regulations, what is the appropriate housing square footage for the following animal species shown below if he weighs 11.0 kg?

1. 1.6 square feet
2. 3.0 square feet
3. 4.3 square feet
4. 6.0 square feet

Question 109: One of the following is **NOT** true about efficacy and safety of anesthetics in the pictured species:

a. High dose of lidocaine has a wide safety margin.

b. Metomidate hydrochoride is useful for sedation and immobilization.

c. Gradual cooling is useful for sedation and immobilization.

d. Isoflurane is unsuitable as a sole anesthetic due is high mortality rate.

Question 110: Which of the following terms best describes the breeding scheme depicted above?

1. Consomic strains
2. Recombinant inbred lines
3. Recombinant congenic strains
4. Advanced intercross lines
5. Diversity outcross

Question 111: This picture shows a wet mount from the posterior brain of a zebrafish, infected with a certain pathogen. Which of the clinical signs listed below is not associated with this infection?

1. Emaciation
2. Scoliosis
3. Lordosis
4. Brain tumors

Question 112: As described in the recent literature, what is projecting from the eye of the mouse pictured?

a. Phenol red thread for tear test

b. Electrode implanted into upper eyelid to detect blinking activity

c. Cannula for serial blood collection from retroobrital sinus

d. Cannula for serial intraocular infusion

Question 113: Which of the following methods would be best to euthanize eggs from this species that are at 60% incubation?

1. <4 C for 4 hours
2. freezing
3. Addling
4. Carbon dioxide exposure > 20 minutes

Question 114: Changing this species to a new environment is associated with a decrease in which of the following parameters?

1. C-reactive protein (CRP)
2. Pig major acute-phase protein (PMAP)
3. Haptoglobin
4. Porcine α-1 acid glycoprotein (PAGP)
5. Albumin

Question 115: Who is this person, who played an integral role in the development of Laboratory Animal Veterinarians?

a. Dr. William Gay, First President of AALAS

b. Dr. James Fox, ACLAM President 1990-1991

c. Dr. Thomas Clarkson, first Training Program Director

d. Dr. Nathan Brewer, First President of AALAS and ACLAM

Question 116: A hematoma (arrow) is present in the mandibular area and extends caudally. Which of the following techniques is commonly associated with this finding?

1. Retroorbital sinus blood withdrawal
2. Sublingual vein blood collection
3. Facial vein blood collection
4. Retroorbital sinus injection
5. Temporal vein blood collection

Question 117: In the image below, which element is not in consistent with current recommendations for housing laboratory swine?

1. Cage bars
2. Water source
3. Food bowl
4. Enrichment device
5. Flooring

Question 118: Findings from an aged, experimentally naïve rat. With which strain is this condition most commonly associated?

1. Sprague Dawley
2. LEW
3. F-344
4. Wistar
5. BUF

Question 119: According to the *Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching*, the procedure depicted below should occur at what age?

a. less than 1 week of age

b. less than 2 weeks of age

c. less than 3 weeks of age

d. less than 4 weeks of age

e. less than 6 weeks of age

Question 120: Approximately what volume of blood does this method require for analysis?

a. 1-2ul

b. 5-10ul

c. 20-25ul

d. 50-100ul

e. 100-200ul

***END OF EXAM***