CHAPTER 6

Laboratory Procedures Questions

**Overview**

##### Preparing for laboratory procedures questions

##### Tips for answering laboratory procedures questions

##### Practice questions

##### answer key and explanations

##### summing it up

**PreParing fOr LaBOraTOry PrOCedUres qUesTiOns**

Another group of questions on the VTNE involves laboratory procedures. These questions make up 15 percent (30 items) of the questions on the exam. These questions test your knowledge of collecting specimens or samples, pre- paring samples for lab tests, performing the lab tests and procedures, and maintaining safety in the lab.

Laboratory procedures questions may ask you to identify the correct definition of a named procedure or to select the correct use of a particular tool or piece of equipment. You might have to identify a correct or incorrect statement among four choices. You may also encounter questions that describe a scenario and ask you how the technician in the description should proceed.

To answer these types of questions, you have to rely on what you know about anatomy, bodily fluids, and common laboratory tests and procedures. You may be asked questions about the process of gathering specimens (e.g., drawing blood, collecting urine or feces, retrieving parasites, etc.) or you may be asked about the results of laboratory tests (e.g., what the sample would look like if it tested positive for the presence of a specific disease).

##### 85

* Measuring cylinders
* Mortar and pestles
* Needles
* Pipettes
* Rubber stoppers
* Test tubes
* Vacutainers

**commonly useD lab equiPment/instruments**

* Bunsen burners
* Centrifuges
* Compound microscopes
* Crucibles
* Evaporating discs
* Forceps
* Glass and plastic bottles

Some laboratory procedures questions focus on one of the most commonly used pieces of equipment in veterinary laboratories—the microscope. You may be asked about specific parts of a microscope (e.g., where a part is located or what its function is) or how to care for a microscope (e.g., how it is stored, how it is cleaned).

Laboratory procedures questions can be based on a multitude of subjects. Questions in this group generally cover topics including:

Common animal diseases Medical terms Toxicology

Preparing, storing, and dispensing biological and chemical agents

Aseptic and sterilization techniques for equipment and supplies

Sample collection, preparation, storing, and shipping techniques

Laboratory diagnostic principles and procedures

Reading laboratory and diagnostic test results Inventory control

Record keeping

To prepare for these questions, study information related to these topics. Also, remember to review the anatomy of the most common animals that small-animal and large-animal veterinarians treat. Study the most common types of tests performed in veterinary laboratories, including the reasons for why these tests are ordered and how normal and abnormal results are determined. Familiarize yourself with the most commonly used lab equipment and tools, and be sure you know how to properly clean and maintain them. Remember that keeping records of your findings in a laboratory and correctly labeling your samples for storage and shipment are also essential to a safe and profes- sional lab environment.

### TiPs fOr answering LaBOraTOry PrOCedUres qUesTiOns

You will perform well on laboratory procedures questions if you recall the following tips when studying for and taking the test:

**1 . Safety first .** Some of the laboratory procedures questions ask about proper sterilization techniques and aseptic techniques. They may ask you about the proper ways to clean laboratory equipment or how to react to a haz- ardous chemical spill. Sanitation and first aid are popular topics for test questions because the safety of techni- cians in a lab is important. If you remember that laboratory safety is crucial, you will find it easier to answer questions concerning chemical spills, biological agent exposure, and laboratory accidents.

For example, you are given a scenario in which a veterinary technician breaks a beaker of toxic chemicals. As the beaker drops to the floor, the chemicals splash onto the technician and hits the area of his skin exposed between his gloves and the sleeve of his lab coat. After the bottle breaks, the technician attempts to pick up the glass pieces and cuts himself. What should the veterinary technician do?

Regardless of the options presented to you, you should know the option you are looking for will include actions that will keep the technician safe and address the technician’s injuries. You should know that he should not continue to pick up the pieces of glass, as they are sharp and covered in toxic chemical agents. You should also know that he should not put his own safety aside to clean up the mess. The correct answer option will include a description of the technician properly washing the area of skin exposed to the chemicals and tending to his cut. Only after the technician is out of harm’s way should he clean the spill.

**laboratory safety techniques**

* + - Monitor the use of quality control samples
    - Train technicians thoroughly
    - Allow only authorized personnel in the lab
    - Prohibit smoking, eating, and drinking
    - Require the use of protective lab coats
    - Wear goggles and disposable gloves when necessary
    - Clean and disinfect work surfaces after procedures
* Clearly label glass and plastic bottles and containers
* Turn off all Bunsen burners when not in use
* Dispose of waste correctly
* Alert all technicians to chemical or other hazardous spills
* Record all laboratory accidents
* Practice inventory control

**2 . Know the body’s fluids and how to collect them .** While studying for the VTNE, focus on the types of fluids typically tested in veterinary labs. These include blood, urine, saliva, cerebrospinal fluid, synovial fluid, thoracic fluid, and peritoneal fluid. Familiarize yourself with what these fluids do and where they are located within the body. What do these fluids look like? What are their colors and consistencies? Do they have distinct smells? Do they change when exposed to the air? From which area of the body would you obtain these fluids? Does this differ among different species or breeds?

Questions in this group ask you about the steps technicians must perform before, during, and after completing pro- cedures. They may ask you about the best positions in which to place a dog when drawing blood, or they may ask you which size needle you should use to draw a specific fluid. Questions about which laboratory tests you would perform if you were looking for a specific disease or using a certain fluid are also included in this group. You will score higher on the VTNE if you know the most common lab tests and the techniques for obtaining the different bodily fluids.

Another topic you should focus on while preparing for laboratory procedures questions on the VTNE is interpreting the results of lab tests. Some questions on the exam will describe a procedure and ask what the results of that pro- cedure should tell you about the animal. Others will ask you about results that may indicate something went wrong in the testing process.

**common laboratory tests anD ProceDures**

* + Abdominocentesis
  + Allergy testing
  + Chemistry panel surveys
  + Colorimetry
  + Complete blood counts
  + Fine-needle aspirates
  + Fungal culture
  + Heartworm test
  + Hemoglobin estimation
* Histopathology
* Necropsy
* Parasite exams
* Skin scraping
* Thyroid function tests
* Toxicology
* Urinalysis
* Virology

For example, you are told that a technician has received a test tube filled with plasma obtained from a cat. The color of the plasma is a dark red. The technician knows the plasma should be either transparent or a light pink. The technician suspects in vitro hemolysis. You are then asked to identify a cause of in vitro hemolysis in the answer options.

To answer this question, you have to know that hemolysis is a process in which red blood cells break, releasing their contents into the plasma or serum. Hemolysis can occur inside the body, but is most commonly the result of poor lab work. You should know osmotic pressure, the size of the needle, the failure to separate plasma, and the vigorous mixing of samples can cause red cells to break and spill into the plasma. Look for one of these causes within the answer choices.

**3 . Look for specific details*.*** One of the easiest ways to choose incorrect answers on the VTNE is to misunderstand what the question is asking you. This is especially common in laboratory procedure questions because some questions are about techniques, some are about the animals themselves, and others are about laboratory rules and safety. This group features such a wide variety of questions that it is easy to get confused. If you take your time, read the question thoroughly, and then read each answer choice, you should be able to choose the correct answers.

You should evaluate certain answer choices more closely depending on what the question is asking you to determine. You may need to focus on the equipment used in a particular scenario. Or, you may have to focus on the behavior of the animal. Sometimes, you may even have to assess the reaction of the client or owner. Once you understand what the question is asking you, go back to the beginning and reread the question looking for important details.

Beware of questions that include the word *except*. If you skip over this word in a question, you may be confused by the answer options. This may result in either spending too much time on one question or choosing the incorrect answer. You should also pay attention to the specific species or breed included in the scenario or question. Other important details may include the age or sex of the animal, as these details may change the way a technician per- forms procedures or interprets results.

### PraCTiCe qUesTiOns

**1 .** A gray and red Vacutainer tube contains:

1. heparin.
2. silicone serum separation material.
3. thrombin.
4. silicone coating with no additive.

**2 .** When performing venipuncture on a cat using the left femoral vein, the patient should be placed in:

1. dorsal recumbency.
2. right lateral recumbency.
3. left lateral recumbency.
4. sternal recumbency.

**3 .** Arthrocentesis is the method used to collect:

1. abdominal fluid.
2. cerebrospinal fluid.
3. synovial fluid.
4. thoracic fluid.

**4 .** A healthy feline should have a red blood cell count ranging from:

1. 5.0–8.5 × 106/mm3.

2. 5.5–9.5 × 106/mm3.

3. 5.5–10.0 × 106/mm3.

4. 7.0–13.0 × 106/mm3.

**5 .** A veterinarian collects a blood sample from a ferret to check the animal’s WBC count. This sample will provide information about the ferret’s:

1. white blood cells.
2. whole blood cells.
3. white blood culture.
4. whole blood culture.

**6 .** Hemolysis is a form of cell disintegration in:

1. white blood cells.
2. red blood cells.
3. platelets.
4. plasma.

**7 .** A postprandial urine sample would be taken after a period of:

1. activity.
2. rest.
3. eating.
4. fasting.

**8 .** Which of the following technicians is violating laboratory safety procedures?

1. Bill uses small- and medium-sized containers instead of large containers to store chemicals in the laboratory.
2. Joseph wears a protective coat, disposable gloves, and goggles while working with chemical agents.
3. Amanda accidentally ingests a biological agent and seeks the aid of the senior lab technician.
4. Tiffany breaks a beaker of toxic substances, cleans up the spill and the broken glass, and goes back to work.

**9 .** The majority of clinical waste disposal containers are which color?

1. Purple
2. Blue
3. Green
4. Red

**10 .** Allthe following arecommon anticoagulants *except*:

1. sodium citrate.
2. heparin.
3. zeolite.
4. EDTA.

### answer key and exPLanaTiOns

3. 3

1. 2

2. 3

4. 3

7. 3

8. 4

9. 4

10. 3

5. 1

6. 2

**1 . The correct answer is 2 .**A gray and redVacutainer tube contains silicone serum separation material. This type of Vacutainer is also known as a Serum Separation Tube. Green Vacutainer tubes contain heparin, choice 1. Yellow and gray Vacutainer tubes contain thrombin, choice 3. Red and yellow Vacutainer tubes contain a silicone coating with no additive, choice 4.

**2 . The correct answer is 3 .** When performing veni- puncture on a cat using the left femoral vein, the patient should be placed in left lateral recumbency. With the patient in this position, the restrainer can occlude the vein by pressing on the medial side of the upper thigh with one hand. None of the posi- tions in choices 1, 2, or 4 would be useful for this procedure, so these options are incorrect.

**3 . The correct answer is 3 .** Arthrocentesis is the method used to collect synovial fluid from joints to help examine joint problems such as lameness or arthritis. This method is not used to collect abdominal fluid, cerebrospinal fluid, or thoracic fluid, so choices 1, 2, and 4 are incorrect.

**4 . The correct answer is 3 .** A healthy feline should have a red blood cell count ranging from 5.5–10.0 RBCs. Choice 1 is incorrect because it indicates the red blood cell count of a dog. Choices 2 and 4 are incorrect because these options indicate the red blood cell counts of an equine and a thoroughbred, respectively.

**5 . The correct answer is 1 .** The blood sample will check the ferret’s white blood cells. The abbre- viation WBC stands for white blood cells. Choices 2, 3, and 4 are incorrect because the abbreviation WBC does not stand for whole blood cells, white blood culture, or whole blood culture.

**6 . The correct answer is 2 .** Hemolysis involves the deterioration of red blood cells. During this process, red blood cells break and release their contents into the plasma or serum that has been extracted

from the animal. Hemolysis is typically visible, as the fluids in the test tube are a dark red color rather than a pink color or clear. Choices 1, 3, and 4 are incorrect because hemolysis does not affect the white blood cells, platelets, or technically the plasma. Although the breaking of the red blood cells influences the plasma, the effect of hemolysis is indirect.

**7 . The correct answer is 3 .** A postprandial urine sample would be taken after a period of eating. This form of urine collection would produce a sample that would be reflective of the patient’s diet. A sample taken after a period of activity, choice 1, would have a low level of concentration. A sample taken after a period of rest, choice 2, would be highly concentrated. A sample taken after a period of fasting, choice 4, would be free of any dietary effects.

**8 . The correct answer is 4 .** Tiffany violated labo- ratory safety procedures when she went back to work without recording or reporting the incident. When spills occur in labs, no matter the substance spilled or where it took place, the incident should always be recorded. Choice 1 is incorrect because small- and medium-sized containers in labs cut down on the occurrence of large spills. Choice 2 is incorrect because Joseph is fully prepared to deal with all chemical and biological agents. Choice 3 is incorrect because Amanda, unsure of what to do in her situation, turns to a superior for guidance, thus alerting the staff to the situation and seeking medical help.

**9 . The correct answer is 4 .** The majority of clinical waste disposal containers in the United States are red. Some laboratories and clinics may choose to color code their waste containers and some clinics use yellow containers for radiation waste; however, most clinics’ containers are red. Choices 1, 2, and

3 are incorrect since the majority of waste disposal bins are not purple, blue, or green.

**10 . The correct answer is 3 .** Zeolite is an absorbent chemical used to help seal various bodily injuries and is considered a procoagulant, rather than an anticoagulant. Choices 1, 2, and 4 are incorrect

because sodium citrate, heparin, and EDTA are common anticoagulants used in veterinary med- icine. Another common anticoagulant is oxalate fluoride.

### sUmming iT UP

* Laboratory procedures questions on the VTNE test your knowledge of collecting specimens and samples, pre- paring samples for lab tests, performing the lab tests and procedures, and maintaining safety in the lab.
* Be sure to study the most common procedures and processes completed in laboratory settings. Also, be familiar with the most common equipment and instruments used in laboratories, as well as the anatomy of patients most commonly treated by veterinarians.
* Be able to identify safety hazards in laboratory settings. Familiarize yourself with safety rules and regulations, including what to do in case of a spill or injury. Remember that the technician’s safety is a main priority and should not be overlooked or ignored.
* Understand all the steps that must be completed before testing specimens. This includes collecting specimens, withdrawing bodily fluids, and stabilizing or positioning the patient. Familiarize yourself with characteristics of the specimens that technicians regularly use to perform tests. Study the different outcomes of each procedure.
* Carefully read each question on the VTNE and look for specific details that may help you answer laboratory procedures questions. The species, breed, age, and sex of an animal may change the way you perform tests or interpret results.