



Choose the correct answer for each of the following questions:

(100 mark)

- The anticoagulants not exist in:  
a. Plasma and Serum      b. Serum      c. Platelets      d. Plasma
- Irregular clumps of red blood corpuscular are called:  
a. Sickle cells      b. Anisocytosis      c. Rouleaux formation      d. Red cell-agglutination
- An increased reticulocyte count indicate?  
a. Bone marrow failure      b. Chronic disease  
c. Active bone marrow response to anemia      d. Dehydration
- Plug contains only platelets is called:  
a. Hemorrhage.      b. Red thrombus.      c. Activated platelets.      d. White thrombus
- \_\_\_\_\_ is the total RBC transit time in cows.  
a. 1 to 2 days      b. 3 to 4 days      c. 6 to 7 days      d. 4 to 5 days
- Enzyme commonly measured in liver function tests to assess hepatocellular damage in dogs and cats?  
a. Alkaline Phosphatase      b. Aspartate Aminotransferase  
c. Alanine Aminotransferase.      d. Bilirubin
- Which thyroid function test is commonly used to diagnose hypothyroidism in dogs?  
a Thyroid Stimulating Hormone (TSH) Level      b. Free T3 (Triiodothyronine) Level  
c. Total T4 (Thyroxine) Level      d. Thyroid Panel including T3, T4, and TSH
- Which of the following conditions is commonly associated with metabolic acidosis in dogs and cats?  
a Repeated urination (polyuria).      b. Hyperkalemia  
c. Vomiting      d Excessive insulin administration
- A definitive diagnosis of feline leukemia virus (FeLV) can be made using:  
a. Blood culture      b. Urine analysis      c. Serological testing      d. Fecal examination
- Cell that appears to have a mouth-like clear area near the center of the RBC:  
a. Stomatocytes      b Reticulocyte.      c. Echinocyte      d. Siderocyte
- The principle function of the Eosinophils is:  
a. Phagocytosis.      b. Detoxification by inactivation of histamine.  
c Immunological      d. Oxygen transport
- Another name of nucleated erythrocyte is:  
a. Rubricyte      b Reticulocyte.      c. Metarubricyte      d. Erythroblast
- Which of the erythrocyte indices is measured in Femtoliters (fl)?  
a. MCV      b. MCH      c. Red blood cells      d. MCHC
- Which of the following laboratory tests is commonly used to assess hydration status in horses?  
a. Electrolyte panel      b. Hematocrit.      c. Complete blood count      d. sweat analysis
- What is the primary purpose of using KOH in the examination of skin scrapings?  
a. kill parasites      b. dissolve keratin      c. stain bacterial      d. enhance blood flow
- RDW indicate:  
a. Anisocytosis      b. Poikilocytosis      c. Microcytosis      d. Reticulocytosis
- A modern method for identifying anthelmintic resistance in fecal parasites in sheep is:  
a. Fecal egg count reduction test.      b. Manual fecal flotation  
c. Direct smear technique      d. Detection single nucleotides polymorphism.

18. Which test is primarily used to evaluate the presence of inflammation or infection in dogs and cats?  
 a. Coagulation profile                      b. Urinalysis  
 c. Serum chemistry panel                  d. Complete blood count
19. In a healthy ruminant, the typical pH range of ruminal fluid?  
 a. 6.8 - 7.2      b. 5.0 - 5.5                      c. 6.0 - 6.5                      d. 7.5 - 8.0
20. What is the normal range for total red blood cell (RBC) count in adult dogs?  
 a. 5.5 - 8.5 million/ $\mu$ L.                  b. 2.0 - 5.0 million/ $\mu$ L  
 c. 10.0 - 12.0 million/ $\mu$ L      d. 8.0 - 10.0 million/ $\mu$ L
21. What is the primary significance of Heinz bodies in a blood smear?  
 a. Sign of oxidative damage to red blood cells      b. Indication of a bacterial infection  
 c. Bone marrow neoplasia                      d. Marker for chronic kidney disease
22. Which of the following is a common cause of secondary polycythemia in animals?  
 a. Immune-mediated hemolytic anemia      b. Ostertagia ostertagi infection  
 c. Chronic hypoxia.      d. Acute blood loss
23. The blood smear of cat with anemia, findings typically indicative of regenerative anemia is?  
 a. Presence of spherocytes                  b. Marked leukocytosis  
 c. Increased number of reticulocytes.                  d. Decreased platelet count
24. Site commonly used for collecting cerebrospinal fluid (CSF) in dogs and cats?  
 a. Jugular vein                      b. Intercostal space.                  c. Cephalic vein      d. Lumbosacral space
25. The primary purpose of performing a fine-needle aspirate (FNA) for animals is?  
 a. To collect cells from a mass or lesion for cytological evaluation  
 b. To obtain a sample of tissue for histopathology  
 c. To measure blood glucose levels  
 d. To assess organ function
26. The culture medium specifically for isolation, identification of Salmonella spp. from fecal samples?  
 a. Blood Agar                      b. XLD (Xylose Lysine Deoxycholate) Agar  
 c. Mac Conkey Agar                  d. Chocolate Agar
27. What is the primary method for diagnosing rabies in a suspected case?  
 a. Serum biochemical analysis      b. Polymerase Chain Reaction (PCR) testing of saliva  
 c. Histopathological examination of brain tissue                  d. X-Ray for brain
28. Which statistical method is typically used for comparing means of laboratory values across different groups?  
 a. Chi-squared test                  b. t-test.                      c. Regression analysis                  d. ANOVA
29. The best laboratory method can be used for detection of microfilaria in domestic animals is:  
 a. Concentration and staining technique.      b. Plasma concentration technique.  
 c. Fixed smear technique.                  d. Hematocrit (Buffy coat) method.
30. Which of the following erythrocytes characterized by dark central area of hemoglobin surrounded by a pale one that in turns surrounded by a peripheral rim of hemoglobin:  
 a. Stomatocytes      b. Codocyte                      c. leptocyte.                      d. Echinocyte
31. ESR is low in:  
 a. Arthritis      b. Anemia.                      c. Polycythemia                  d. Malignancy
32. Hormone released from the kidney stimulates the bone marrow to undergo hematopoiesis:  
 a. Thyroxin                      b. Adrenalin.                      c. Insulin                      d. Erythropoietin
33. the preferred sample for arterial blood gas analysis is?  
 a. Heparinized whole plasma                  b. EDTA whole blood  
 c. Heparinized plasma                      d. EDTA plasma

34. Causes of hyperkalemia may include all-of the following conditions, Except:
- a. Hemolysis in horses
  - b. Metabolic alkalosis
  - c. Renal failure
  - d. Severe rhabdomyolysis
35. Ability of an assay to get the same result if a sample is analyzed several times, also called reproducibility or random analytical error:
- a. Analytical error
  - b. Analytical value
  - c. Analytical precision
  - d. Analytical imprecision
36. Smallest amount of substance that can be reliably detected by an assay:
- a. Analytical specificity
  - b. Reference individual
  - c. Analytical value
  - d. Detection limit
37. The gold standard for diagnosing bacteremia infections is:
- a. Blood culture
  - b. Physical examination
  - c. Fecal examination
  - d. Urinalysis
38. A major benefit of using modern imaging techniques for blood smear examination is:
- a. Cost-effectiveness
  - b. Immediate results
  - c. Reducing the need for laboratory tests
  - d. Non-invasive diagnosis
39. What are the primary types of leukocytes involved in the immune response?
- a. Erythrocytes and thrombocytes
  - b. Platelets and plasma cells
  - c. Neutrophils and lymphocytes
  - d. Basophils and eosinophils
40. Difference between the highest and lowest observations is:
- a. Ratio
  - b. Mean
  - c. Median
  - d. Range
41. A graphical tool used in laboratories to monitor the quality control of assays over time:
- a. Laboratory safety chart
  - b. Durable raxine chart
  - c. Laboratory Flow Chart
  - d. Levy Jennings chart
42. A laboratory method that uses a sample of tissue, blood, or other body fluid to check for certain genes, proteins, or other molecules that may be a sign of a disease or condition called
- a. Urine testing
  - b. Coprological testing
  - c. Blood testing
  - d. Biomarker testing
43. Which of the following disease affect liver function tests of ruminants?
- a. Milk fever
  - b. Fatty liver disease
  - c. Listeriosis
  - d. Mange
44. What is a common tool used in light microscopy?
- a. Magnetic resonance imaging
  - b. Visible light and lenses
  - c. Electron beams
  - d. Fluorescent markers
45. Which of the following anticoagulant cause clumping of WBC, unsuitable for smears, as it interferes with stain ability of WBC
- a. EDTA
  - b. Heparin
  - c. Sodium citrate
  - d. potassium oxalate
46. In hematology, what does a high white blood cell count indicate?
- a. Anemia
  - b. Infection or inflammation
  - c. Normal health
  - d. Dehydration
47. Which laboratory diagnostic technique is used to evaluate digestive tumors in dogs?
- a. Radiography
  - b. Biopsy
  - c. Endoscopy
  - d. Cytology
48. Test tubes requiring clotted blood:
- a. Blue stopper tube
  - b. Purple stopper tube
  - c. Red stopper tube
  - d. Green stopper tube
49. What factor does NOT affect the accuracy of laboratory tests?
- a. Sample collection techniques
  - b. Animal diet prior to testing
  - c. Time of day
  - d. Presence of anticoagulants
50. \_\_\_\_\_ cause shrinkage of cell and increase the volume of the blood:
- a. EDTA
  - b. ~~Heparin~~
  - c. Potassium oxalate
  - d. Sodium florid
51. Magnesium sulfate flotation method is suitable for detection of:
- a. Nematode.
  - b. Trematode.
  - c. protozoa.
  - d. Mite.
52. The normal form of feces in cattle are:
- a. Semisolid mass.
  - B. Balls.
  - c. pellets.
  - d. Somewhat solid.
53. The Mosquitoes is the intermediate host for:
- a. *Babesia bigemina*.
  - b. *Theileria equi*.
  - c. *Babesia bovis*.
  - d. *Dirofilaria immitis*

54. The Mc master fluids that used in fecal examination is:  
 a. Sugar solution. b. Tap water. c. Methyl alcohol. d. Formalin.
55. The time that is required for fecal culture is:  
 a. 14 - 21 days. b. 14 - 81 days. c. 14 - 15 days. d. 14-30 days.
56. Baermann technique is used for detection of:  
 a. Lice eggs. b. Lung worm larvae. c. Trematode eggs. d. Mite eggs.
57. Fecal culture used for detection the presence of \_\_\_\_\_ helminth.  
 a. Nematode egg. b. Third larvae stage. c. Cestodes egg. d. Trematode eggs.
58. Anaplasma species are divided in to two species:  
 a. Marginale and Vertical. b. Centrale and Vertical.  
 c. Marginale and Centrale. d. Centrale and Horizontal.
59. The diluting fluids that used for thrombocytes counts is:  
 a. EDTA b. Rees-Ecker, Ammonium oxalate and EDTA c. Ammonium oxalate d. Rees-Ecker
60. Ixodidae can be divided in to:  
 a. Lice and Soft tick. b. Soft and Hard tick. c. Hard and fleas tick. d. Mite and hard tick.
61. Quantitative examination method of feces is used to examination of:  
 a. Trematode eggs. b. Identification of larvae type in feces.  
 c. Counting of the number of egg in feces. d. Coprological examination
62. Sodium nitrate flotation method is suitable for detection of:  
 a. Trematode egg. b. Mite eggs. c. Nematode eggs. d. *Fasciola hepatica.*
63. The flotation fluid used in fecal examination is:  
 a. Salts and Tap water. b. Sugar and Salt solution. C. Tap water and Chloride d. Tap water.
64. All RBC results, including analysis of regenerative response and morphologic features  
 a. Leucon b. Andron. c. Erythron. d. Lymphon
65. Lugols iodine and New Methylene Blue are the common stain feces used in:  
 a. Sedimentation method. b. Flotation method. c. Direct method. d. Fecal cultures.
66. \_\_\_\_\_ is the type of Babesiosis in cattle.  
 a. *Babesia canis.* b. *Babesia motasi.* c. *Babesia felis.* d. *Babesia bovis.*
67. The Demodex mite are live in the:  
 a. Pituitary glands. b. Salivary glands. c. Parotid glands. d. Hair follicles and Sebaceous glands.
68. Common genus of the larval flies include:  
 a. *Oestrus ovis* and *Hypoderma bovis.* b. *Oxyuris equi.* c. Nematode spp. d. Fleas and Flies.
69. The sedimentation fluid that used for fecal examination is:  
 a. Sugar solution. b. Physiological saline. c. Sodium chloride. d. Tap water.
70. Flies are divided in to:  
 a. Biting flies. b. Biting and Sucking flies. c. Sucking flies. d. Biting Nuisance flies.
71. Intensely sour odor of rumen fluid is observed in cases of:  
 a. Esophageal groove failure. b. Alkalosis. c. frothy bloat. d. Acidosis
72. Physical examination of rumen fluid included:  
 a. Motility of microflora. b. PH, Sedimentation activity test.  
 c. Microscopic. d. Color, Odor, Consistency
73. Normal pH of rumen fluid is ranges between:  
 a. 6-7 b5-5.5. c. less than 4. d. above than 9.
74. The normal time needed for color changed by ruminal microflora in Methylene blue reduction test is:  
 a. 15 minutes. b. 10 minutes. c. 12 minutes. d. 3 minutes.
75. Flexible piece of plastic tubing with a bulbous-shaped end designed to collect of rumen fluid is called:  
 a. Rumen fistula. b. Rumenocentesis. c. Needle puncture of the rumen. d. Stomach tube
76. The normal odor of rumen fluid is:  
 a. Ammonia smell. b. Intensely sour odor. c. aromatic. d. putrefy odor
77. The pH of rumen fluid can be estimated by:  
 a. Acid base balance b. Saccharometer. c. pH paper d. pH tube.
78. One of the indirect leukocytes count test of milk examination is:  
 a. Hotis test. b. Whiteside test. c. Bromothymole blue. d. chloride test.

79. The abnormally acid milk and pH below 5.2 can be detected by:  
 a. Chloride test.    b. Whiteside test.    c. Bromocresol purple test.    d. Bromothymol blue test.
80. The Special stain of milk (milk film) is:  
 a. Gram stain.    b. New methylene blue stain.    c. Newman-Lampert stain.    d. Ziehl-Neelsen stain.
81. The selective medium differentiate between types of Streptococci depending on characteristic colonies is:  
 a. Mannitol salt agar.    b. Edward medium.  
 c. Sodium Azide-Crystal Violet Blood agar.    d. Nutrient agar.
82. The causative agent of pyelonephritis is:  
 a. *E. coli.*    b. *Corynebacterium renale.*    c. *Mycobacterium bovis.*    d. *Campylobacter fetus.*
83. Modified Ziehl-Neelsen stain is used to determine:  
 a. *Pasteurella spp.*    b. *Mycobacterium spp.*    c. *Brucella spp.*    d. *Clostridium spp.*
84. The type of sample that should be submitted to laboratory for detection of John's disease is:  
 a. milk sample.    b. Fecal sample.    c. urine sample.    d. blood sample.
85. The selective media used for culture of milk sample is:  
 a. Nutrient agar.    b. Mannitol salt agar.    c. Blood agar.    d. Chocolate agar.
86. Early Laboratory diagnosis of leptospirosis can be done by using:  
 a. dark field examination.    b. fluorescent examination.  
 c. direct examination.    d. supernatant examination.
87. *Corynebacterium renale* can be confirmed by microscopic examination of:  
 a. urine sample.    b. fecal sample.    c. blood sample.    d. milk sample.
88. Confirmation of a clinical diagnosis of Actinomycosis is based upon the demonstration of so-called .....in a purulent exudate.  
 a. Gram positive rods.    b. Gram negative short rods.    c. Gram positive bacilli.    d. ray fungus.
89. Glycine tellurite agar used to grow of Staphylococci bacteria which characterized by:  
 a. black colonies.    b. red colonies.    c. yellow colonies.    d. blue colonies.
90. The term "immunopathology" refers to:  
 a. Diseases caused by immune system dysfunction    b. Diseases caused by infections  
 c. Genetic diseases    d. Environmental diseases
91. The normal pH of milk is:  
 a. 6.4- 6.8.    b. 7.4- 7.8.    c. 5.4- 5.8.    d. 8.2- 8.6.
92. *Brucella species* in smear stained with Koster stain appear as extracellular:  
 a. red coccobacillary rods.    b. blue coccobacillary rods.  
 c. yellow coccobacillary rods.    d. black coccobacillary rods
93. The silver nitrate solution and potassium chromate solution are the reagents of:  
 a. chloride test.    b. catalase test.    c. CMT.    d. PH test.
94. The purple top tube that is used to collect blood for coagulation testing contains what additive?  
 a. Ethylenediaminetetraacetic acid    b. Heparin.    c. Methylene blue    d. Sodium fluoride
95. The culture medium specifically for isolation, identification of Salmonella spp from fecal samples?  
 a. Blood Agar    b. XLD (Xylose Lysine Deoxycholate) Agar  
 c. Mac Conkey Agar    d. Chocolate Agar
96. The total number of thrombocytes in peripheral blood can be determined by:  
 a. Direct methods.    b. Indirect methods.    c. Direct and indirect methods.    d. EDTA methods.
97. Heinz bodies are may easily be seen in blood smear stained with:  
 a. Methylene blue.    b. Polychrome methylene blue.    c. Crystal violet.    d. Giemsa stain.
98. The MCV is used to classify erythrocytes as:  
 a. Normocytic.    b. Microcytic.    c. Microcytic Normocytic and macrocytic.    d. Macrocytic.
99. Thrombocytes are small cytoplasmic fragments from:  
 a. liver.    b. Intestine.    c. Megakaryocytes.    d. Kidneys.
100. The unit of mean corpuscular Hemoglobin (MCH) is:  
 a. mg/L.    b. g/dL.    c. Picogram    d. Femtoliters.