1. In FMD virus, which structural protein is located internally and not exposed on the virus surface?
   A) VP1
   B) VP2
   C) VP3
   D) **VP4**
2. The DIVA strategy in FMD control is based on detecting antibodies against:
   A) Structural proteins
   B) Viral RNA
   C) **Non-structural proteins**
   D) Capsular antigens
3. Which characteristic of the FMD virus contributes most to its rapid inactivation by environmental factors?
   A) Its enveloped nature
   B) **Sensitivity of its exposed surface proteins (VP1–VP3) to pH and desiccation**
   C) Its double-stranded RNA genome
   D) Its low mutation rate
4. FMD virus excretion begins up to how many days before clinical signs appear?
   A) 1 day
   B) 2 days
   C) **4 days**
   D) 7 days
5. In FMD, pigs are classified as which type of host due to high virus excretion?
   A) Maintenance host
   B) **Amplifier host**
   C) Indicator host
   D) Reservoir host
6. The primary diagnostic test that differentiates infected from vaccinated animals in FMD is:
   A) Virus isolation
   B) Complement fixation test
   C) **NSP antibody ELISA**
   D) Virus neutralization test
7. Bacillus anthracis produces a tripartite toxin. Which component is encoded by plasmid pXO2?
   A) Edema factor
   B) Lethal factor
   C) **The poly-D-glutamic acid capsule (virulence factor)**
   D) Protective antigen
8. The rapid progression of anthrax septicemia is primarily due to:
   A) Slow bacterial growth
   B) Capsule-mediated immune evasion only
   C) **Synergistic action of its exotoxins causing circulatory collapse**
   D) High spore resistance in soil
9. The McFadyean reaction in anthrax diagnosis demonstrates:
   A) Spore formation
   B) Toxin activity
   C) **A pink capsule against a blue background**
   D) Bacterial motility

10. Anthrax spores can survive in soil for:
    A) Several days
    B) Several months
    C) Several years
    D) **Decades**
11. Hemorrhagic septicemia is primarily caused by:
    A) Mannheimia haemolytica
    B) Escherichia coli
    C) **Pasteurella multocida type 1**
    D) Clostridium chauvoei
12. In hemorrhagic septicemia, the bacteria primarily proliferate in the:
    A) Lungs
    B) Liver
    C) **Tonsillar region**
    D) Kidneys
13. Monsoon conditions predispose cattle to hemorrhagic septicemia because:
    A) They lower ambient temperatures
    B) They reduce feed quality
    C) **They increase environmental humidity and stress, promoting bacterial growth**
    D) They cause overcrowding
14. Early treatment of hemorrhagic septicemia relies on which antibiotic?
    A) Tetracycline
    B) Sulfonamides
    C) **Penicillin**
    D) Chloramphenicol
15. In sheep pasteurellosis, Mannheimia haemolytica A2 is most often associated with:
    A) Septicaemia in neonates
    B) **Pneumonic pasteurellosis in all age groups**
    C) Mastitis in ewes
    D) Cutaneous abscesses
16. The leukotoxin produced in pasteurellosis specifically targets:
    A) Epithelial cells
    B) **Ruminant leukocytes (neutrophils and macrophages)**
    C) Red blood cells
    D) Platelets
17. Listeriosis is diagnosed using the cold enrichment method because Listeria monocytogenes can grow at:
    A) 0°C
    B) 2°C
    C) **4°C**
    D) 10°C
18. In bovine tuberculosis, the primary complex is most often found in the:
    A) Lymph nodes
    B) **Lungs (following inhalation)**
    C) Liver
    D) Kidneys
19. “Pearl’s disease” in tuberculosis refers to:
    A) Diffuse lung calcification
    B) **Nodular, grape-like lesions on serosal surfaces**

C) Caseating granulomas in lymph nodes
D) Hepatic abscesses

20. Johne's disease (paratuberculosis) is characterized by a long incubation period primarily due to:
A) Dormant spore formation
B) Immune evasion via antigenic variation
C) **Slow replication of Mycobacterium avium subspecies paratuberculosis in the intestinal mucosa**
D) Rapid clearance in early stages
21. The thickened and corrugated intestinal mucosa in Johne's disease is caused by:
A) Granuloma formation
B) **Massive infiltration of macrophages in the mucosa**
C) Hemorrhagic necrosis
D) Fibrous scarring
22. The most common serological test used to screen for Johne's disease is:
A) PCR assay
B) Western blot
C) **Complement fixation test (CFT)**
D) Agglutination test
23. Brucella melitensis is distinguished serologically by an antigen ratio (A:M) of:
A) 20:1
B) **1:20**
C) 1:1
D) 10:10
24. For brucellosis, the confirmatory test following screening is usually:
A) PCR
B) **Standard Tube Agglutination Test (STAT)**
C) Western blot
D) ELISA
25. Human brucellosis is most frequently acquired by:
A) Inhalation of aerosols
B) Direct skin contact
C) **Consumption of unpasteurized dairy products**
D) Vector transmission
26. A critical factor in the eradication of rinderpest was:
A) Natural herd immunity
B) **A coordinated international vaccination and surveillance program**
C) Use of antiviral drugs
D) Genetic modification of livestock
27. Peste des petits ruminants (PPR) shows higher mortality in goats because:
A) They have a higher viral load in secretions
B) They are exposed to more stressors
C) **Inherent immunological differences make goats more susceptible to the PPR virus**
D) They are more likely to be co-infected with other viruses
28. The PPR virus is most closely related to:
A) Canine distemper virus
B) Measles virus
C) **Rinderpest virus**
D) FMD virus

29. In clostridial diseases, rapid tissue necrosis in Black Quarter is due to:
    A) Slow bacterial replication
    B) Host immune response
    C) **Rapid toxin production by Clostridium chauvoei**
    D) Environmental contamination
30. Pulpy kidney disease in lambs is caused by:
    A) Clostridium perfringens type A
    B) **Clostridium perfringens type D**
    C) Clostridium tetani
    D) Clostridium botulinum
31. Tetanus toxin (tetanospasmin) reaches the CNS via:
    A) Hematogenous spread
    B) Lymphatic drainage
    C) **Retrograde axonal transport from peripheral motor end plates**
    D) Direct diffusion
32. In botulism, the clinical syndrome is primarily due to:
    A) Direct bacterial invasion of nerves
    B) **Ingestion of preformed toxin that blocks acetylcholine release**
    C) Immune-mediated demyelination
    D) Inflammatory cytokine release
33. The “saw horse” stance is most characteristic of:
    A) Botulism
    B) Black Quarter
    C) **Tetanus**
    D) Anthrax
34. In contagious mastitis, the most common pathogen is:
    A) Escherichia coli
    B) **Staphylococcus aureus**
    C) Streptococcus uberis
    D) Mycoplasma bovis
35. The California Mastitis Test (CMT) primarily detects:
    A) Bacterial count
    B) **Elevated somatic cell count indicating inflammation**
    C) Milk fat alterations
    D) Protein denaturation
36. In subclinical mastitis, milk pH typically rises to:
    A) Below 6.0
    B) 6.5–6.8
    C) **Above 7.4**
    D) Exactly 7.0
37. Neonatal diseases in calves during the first 48 hours are most often due to:
    A) Bacterial sepsis
    B) **Metabolic and noninfectious factors such as hypoglycemia and hypothermia**
    C) Viral infections
    D) Parasitic infestations
38. Enterotoxemic neonatal calf diarrhea is most commonly caused by:
    A) Rotavirus
    B) Salmonella
    C) **Enteropathogenic Escherichia coli**
    D) Clostridium perfringens type C

39. A serum total protein of ≥5.2 g/dL in neonatal calves indicates:
    A) Dehydration
    B) **Adequate transfer of passive immunity**
    C) Liver dysfunction
    D) Overfeeding
40. Failure of passive transfer in neonates is best assessed by measuring:
    A) Serum glucose
    B) **Serum IgG or total protein levels**
    C) White blood cell count
    D) Serum creatinine
41. The growth of Brucella in fetal tissues is enhanced by the presence of:
    A) Glucose
    B) **Erythritol**
    C) Fructose
    D) Sucrose
42. The milk ring test in brucellosis is used to:
    A) Measure milk fat content
    B) **Screen for antibodies in milk indicating infection**
    C) Detect bacterial DNA
    D) Assess somatic cell counts
43. In rinderpest, the key factor that led to its eradication was:
    A) Natural resistance in animals
    B) **An effective global vaccination and surveillance campaign**
    C) Use of antiviral medications
    D) Genetic modification of the virus
44. PPR exhibits higher mortality in goats compared to sheep primarily due to:
    A) Increased environmental exposure
    B) **Inherent immunological susceptibility in goats**
    C) Higher virus shedding in goats
    D) Differences in management practices
45. The ratio of antigen A to M in Brucella melitensis is typically:
    A) 20:1
    B) 1:1
    C) 10:1
    D) **1:20**
46. Ring vaccination in FMD is implemented to:
    A) Provide immediate long-term immunity
    B) Eradicate the virus globally
    C) **Create an immunological barrier to contain virus spread**
    D) Differentiate infected from vaccinated animals
47. In FMD, cattle are considered an indicator host because:
    A) They excrete the virus in large quantities
    B) They have a high mortality rate
    C) **They exhibit clear clinical signs useful for diagnosis**
    D) They maintain a carrier state
48. Prolonged detection of FMD virus in milk and semen post-infection implies that:
    A) Animals are fully immune after recovery
    B) **Strict control measures are needed even after clinical recovery**
    C) The virus is non-contagious post-recovery
    D) Vaccination is ineffective

49. In tuberculosis, a false-negative tuberculin test may occur due to:
    A) Recent vaccination
    B) **Advanced disease with an anergic response**
    C) Early infection
    D) High ambient temperatures
50. The "drumstick" appearance observed in Clostridium tetani spores is diagnostic for:
    A) Black Quarter
    B) Botulism
    C) **Tetanus**
    D) Malignant edema
51. In Listeriosis diagnosis, cold enrichment is performed on which type of specimen?
    A) Blood
    B) **Brain tissue from affected animals**
    C) Milk
    D) Fecal material
52. Bos taurus calves are generally more resistant to cold stress than Bos indicus calves because:
    A) They are larger in size
    B) They have thicker skin
    C) **They possess more effective thermoregulatory mechanisms**
    D) They have higher metabolic rates
53. In mastitis prevention, the most critical management practice is:
    A) Increasing milking frequency
    B) **Maintaining strict udder hygiene and proper milking techniques**
    C) Supplementing feed with extra proteins
    D) Avoiding dry cow therapy
54. The "white side test" in mastitis is based on detecting:
    A) Bacterial DNA
    B) **Alkalinization of milk due to increased chloride concentration**
    C) Somatic cell count changes
    D) Milk fat variations
55. Enterotoxemic colibacillosis in neonatal calves is characterized by:
    A) Profuse watery diarrhea and recovery
    B) **Sudden collapse and death with minimal diarrhea**
    C) Chronic wasting over weeks
    D) Persistent coughing and fever
56. Elevated serum gamma-glutamyl transferase (GGT) activity in neonates indicates:
    A) Liver failure
    B) **Successful colostrum ingestion and passive immunity transfer**
    C) Muscle damage
    D) Dehydration
57. In severe PPR cases in goats, one of the most critical clinical signs is:
    A) Mild nasal discharge
    B) **Profuse mucopurulent nasal discharge with severe respiratory distress and diarrhea**
    C) Localized skin lesions
    D) Low-grade fever only
58. Vaccinating bulls with live Brucella vaccines like S-19 is avoided because:
    A) Bulls do not develop an immune response
    B) **Vaccination may lead to bacterial localization in the testes, making them**

carriers

C) Bulls are naturally resistant

D) The vaccine is ineffective in males

59. In bovine tuberculosis, an anergic response causing a false-negative tuberculin test is most likely seen in:

A) Recently infected animals

B) **Advanced cases with extensive lesions**

C) Healthy vaccinated cattle

D) Calves under 6 months

60. Black Quarter in cattle typically presents with:

A) Chronic lameness over weeks

B) **Rapid onset of gas gangrene in muscles leading to death within 24–60 hours**

C) Gradual weight loss

D) Neurological deficits

61. The critical ambient temperature below which Bos taurus calves are at risk of hypothermia is approximately:

A) 5°C B) 10°C C) **13°C** D) 20°C

62. Metabolic acidosis in neonatal diarrhea is primarily due to:

A) Lactic acid accumulation

B) **Loss of bicarbonate ions from the intestinal tract**

C) Renal failure

D) Excessive gastric acid secretion

63. The “navel ill” syndrome in neonatal calves is best described as:

A) A viral infection of the umbilicus

B) **A localized infection of the umbilical cord leading to systemic bacteremia**

C) An autoimmune response in the navel

D) Nutritional deficiency at birth

64. In FMD, which factor contributes to the virus’s inactivation by desiccation?

A) Its lipid envelope

B) **The sensitivity of its exposed surface proteins (VP1–VP3) to drying**

C) Its double-stranded RNA genome

D) Its replication rate

65. The detection of antibodies against non-structural proteins in FMD-infected animals allows for:

A) **Differentiation between infected and vaccinated animals**

B) Faster virus isolation

C) Higher vaccine efficacy

D) Reduced clinical signs

66. In Pasteurellosis among pigs, the most commonly isolated organism is:

A) Mannheimia haemolytica B) Bibersteinia trehalosi C) **Pasteurella multocida** D) Streptococcus suis

67. The “hotis test” in mastitis is designed to assess:

A) Milk pH

B) **Catalase activity and chloride concentration in milk**

C) Somatic cell count

D) Bacterial endotoxin levels

68. In generalized bovine tuberculosis, the presence of miliary tubercles indicates:

A) Localized infection

B) **Hematogenous dissemination of Mycobacterium bovis**

C) Early-stage infection
D) A non-infectious process

69. In septicemic colibacillosis of neonates, the clinical course is typically:
A) Gradual weight loss over several days
B) **Sudden collapse and rapid death within a few hours**
C) Prolonged diarrhea with recovery
D) Chronic intermittent fever

70. Oil-adjuvant vaccines in hemorrhagic septicemia are favored because they:
A) Have minimal side effects
B) Are cost-effective
C) Provide immediate immunity
D) **Offer prolonged immunity with a single dose**

71. Early-life exposure to contaminated feed in Johne's disease is critical because:
A) It causes acute infection
B) **Young animals are more susceptible due to an immature immune system**
C) It leads to immediate clinical signs
D) It enhances vertical transmission

72. The vesicular lesions in FMD are distinguished by their tendency to:
A) Remain intact for several days
B) **Rupture within 24 hours leaving raw, painful ulcers**
C) Be hemorrhagic and persistent
D) Occur only on the udder

73. In FMD control, "ring vaccination" is used to:
A) Eradicate the virus globally
B) Vaccinate only the youngest animals
C) **Establish an immunological barrier around an outbreak area**
D) Replace all conventional vaccination protocols

74. Cattle are considered an indicator host in FMD because they:
A) Excrete the highest virus titers
B) Remain asymptomatic
C) **Exhibit clear clinical signs that aid in early detection**
D) Serve as a reservoir with no clinical disease

75. The persistence of FMD virus in fecal slurry during winter (up to 6 months) is most significant because it:
A) Indicates the virus is resistant to all disinfectants
B) Suggests aerosol transmission is predominant
C) **Highlights the role of environmental reservoirs in disease spread**
D) Confirms that the virus is unaffected by temperature changes

76. A false-negative tuberculin test in cattle is most likely due to:
A) Recent exposure to non-tuberculous mycobacteria
B) **Advanced disease with anergic response**
C) Over-vaccination
D) Improper injection technique

77. In neonatal calf diarrhea, the enterotoxemic form is characterized by:
A) Profuse watery diarrhea with recovery
B) **Sudden collapse and death with minimal diarrheal output**
C) Chronic intermittent fever
D) Persistent coughing

78. The high mutation rate of the FMD virus primarily complicates:
A) Its environmental survival

B) **Vaccine design due to antigenic variation**
C) Its ability to cause clinical disease
D) The use of antiviral drugs

79. The “tiger heart” appearance observed during necropsy of FMD-affected young animals indicates:
A) Chronic myocardial fibrosis
B) **Acute myocarditis leading to sudden death**
C) A healed lesion from previous infection
D) Secondary bacterial infection
80. To maintain body temperature in neonatal calves during cold stress, the most critical management practice is:
A) Reducing feed intake
B) Increasing physical exercise
C) **Providing shelter and supplemental heat**
D) Immediate weaning
81. In brucellosis, a common sequela following abortion in infected cows is:
A) Increased milk yield
B) **Retention of the placenta with subsequent metritis**
C) Rapid recovery without complications
D) Formation of calcified granulomas
82. Which property of the FMD virus makes it particularly susceptible to inactivation by mild heat?
A) Its double-stranded DNA genome
B) **The delicate structure of its capsid proteins (VP1–VP3)**
C) Its lipid envelope
D) Its robust polymerase
83. The milk ring test in brucellosis is performed to:
A) Assess milk fat content
B) **Detect antibodies in milk indicative of Brucella infection**
C) Culture Brucella organisms
D) Determine somatic cell count
84. Mastitis occurring immediately after parturition is often due to:
A) Over-vaccination of the dam
B) **Contamination during milking combined with post-calving immune suppression**
C) Excessive milk production alone
D) Genetic predisposition
85. In overcrowded neonatal calf environments, which agent is most commonly linked to outbreaks of diarrhea?
A) **Rotavirus**
B) Salmonella spp.
C) Cryptosporidium
D) Enteropathogenic E. coli
86. In Black Quarter, the rapid progression to gas gangrene is primarily due to:
A) Tetanospasmin production
B) **Necrotizing toxin production by Clostridium chauvoei**
C) Beta toxin from Clostridium perfringens
D) Host inflammatory response
87. Dry cow therapy is primarily aimed at:
A) Treating active mastitis

B) **Preventing new intramammary infections during the dry period**
C) Enhancing immediate post-calving milk yield
D) Reducing udder size

88. In neonatal diarrhea, assessment of passive immunity is best done by measuring:
A) Serum glucose
B) **Serum total protein levels**
C) White blood cell count
D) Serum cholesterol

89. A major challenge in controlling Johne's disease is:
A) Its high rate of spontaneous recovery
B) **The prolonged incubation period leading to undetected early infections**
C) Overwhelming immune responses
D) Effective vaccine-induced immunity

90. Which clinical sign is NOT typically associated with PPR in small ruminants?
A) High fever
B) Necrotic stomatitis
C) Mucopurulent nasal discharge
D) **Vesicular lesions on the feet**

91. In bovine tuberculosis, the term "post primary dissemination" refers to:
A) Localized lung infection
B) **Hematogenous spread from the primary complex to multiple organs**
C) Formation of a single granuloma
D) Direct transmission via milk

92. Early and repeated administration of tetanus antitoxin (ATS) is most critical because it:
A) Vaccinates against tetanus
B) **Neutralizes circulating tetanus toxin before it causes irreversible damage**
C) Kills Clostridium tetani
D) Prevents spore formation

93. The detection of antibodies against non-structural proteins in FMD is crucial because it:
A) Confirms vaccine-induced immunity
B) **Differentiates naturally infected animals from vaccinated ones**
C) Indicates active viral replication only
D) Has no diagnostic significance

94. Sudden weather changes and stress factors in cattle are most often linked to outbreaks of:
A) Tetanus
B) Botulism
C) **Black Quarter (Blackleg)**
D) Mastitis

95. Twin-born calves exhibit higher mortality rates primarily because of:
A) Genetic defects
B) Overnutrition
C) **Failure of passive transfer of immunoglobulins**
D) Increased birth weight

96. A high mutation rate in the FMD virus primarily poses challenges in:
A) Environmental stability
B) **Antigenic variation that complicates vaccine design**

C) Rapid replication in hosts
D) Inter-species transmission

97. For the cold enrichment method in Listeriosis diagnosis, which sample is most appropriate?
A) Blood
B) Milk
C) **Brain tissue from encephalitic cases**
D) Fecal samples

98. In mastitis, an elevated chloride concentration in milk is indicative of:
A) Normal lactation
B) **Inflammatory changes due to infection**
C) Viral contamination
D) Protein deficiency

99. The “test and slaughter” policy in brucellosis control is implemented because:
A) Vaccination is completely ineffective
B) **It is the gold standard method for eliminating infection from a herd**
C) It guarantees immediate recovery
D) It is cost-free

100. In neonatal calf diarrhea, which pathogen is most likely to induce enterotoxemic shock leading to sudden death?
A) Rotavirus
B) Cryptosporidium
C) **Enteropathogenic Escherichia coli**
D) Clostridium perfringens type C