

**Winter 2026**  
**Pathogenic Bacteriology**  
**Exam IV**

1. Which characteristic best describes *Campylobacter jejuni*?

- A. Curved Gram-negative rod
- B. Gram-positive rod
- C. Acid-fast bacillus
- D. Encapsulated coccus
- E. Spore-forming anaerobe

2. Actinomyces species are normal flora of the:

- A. Skin only
- B. Colon only
- C. Oral cavity and gastrointestinal tract
- D. Bloodstream
- E. Lungs

3. A decrease in *Lactobacillus* populations in the vagina predisposes to:

- A. Actinomycosis
- B. Bacterial vaginosis
- C. Tetanus
- D. Botulism
- E. Typhoid fever

4. *Cutibacterium acnes* (*Propionibacterium acnes*) contributes to acne pathogenesis primarily through:

- A. Exotoxin production
- B. Acid-fast cell wall lipids
- C. Spore formation
- D. Inflammation triggered by lipase activity
- E. Capsule-mediated immune evasion

5. A microbiology lab isolates a small gray colony from stool that grows only under reduced oxygen tension and at 42°C. Which organism is most likely?

- A. *Helicobacter pylori*
- B. *Campylobacter fetus*
- C. *Shigella dysenteriae*
- D. *Salmonella enterica*
- E. *Campylobacter jejuni*

6. A 60-year-old man with chronic *Helicobacter pylori* infection develops gastric adenocarcinoma. Which mechanism contributes to malignancy?

- A. Direct DNA toxin
- B. Chronic inflammation and epithelial damage
- C. Superantigen stimulation
- D. Capsule-mediated invasion
- E. Spore formation

7. A 30-year-old develops ascending flaccid paralysis two weeks after severe diarrheal illness caused by *Campylobacter jejuni*. Which pathogenic mechanism explains this complication?

- A. Direct neurotoxin
- B. Molecular mimicry of gangliosides
- C. Endotoxin shock
- D. Capsule invasion
- E. Hemolysin-mediated damage

8. A spiral Gram-negative bacterium uses multiple flagella to penetrate gastric mucus and colonize the stomach lining. Which organism is described?

- A. *Campylobacter jejuni*
- B. *Helicobacter pylori*
- C. *Treponema pallidum*
- D. *Vibrio vulnificus*
- E. *Escherichia coli*

9. *Cardiobacterium hominis* most commonly causes:

- A. Infective endocarditis
- B. Acute pneumonia
- C. Diarrhea
- D. Skin abscess
- E. Meningitis

10. *Brucella* species persist in the host primarily by:

- A. Producing exotoxins that destroy phagocytes
- B. Forming endospores
- C. Invading epithelial cells exclusively
- D. Producing a thick polysaccharide capsule
- E. Surviving and replicating within macrophages

11. A 6-year-old unvaccinated child presents with paroxysmal coughing followed by inspiratory "whoop." PCR from nasopharynx is positive. Most likely pathogen?

- A. *Legionella pneumophila*
- B. *Brucella melitensis*
- C. *Bartonella henselae*
- D. *Bordetella pertussis*
- E. *Streptobacillus moniliformis*

12. A bird owner presents with fever and atypical pneumonia. Diagnosis?

- A. *C. psittaci*
- B. *C. trachomatis*
- C. *C. pneumoniae*
- D. Influenza
- E. *Legionella*

13. Which disease is a leading preventable cause of blindness?

- A. Lymphogranuloma venereum
- B. Trachoma**
- C. Psittacosis
- D. Atypical pneumonia
- E. Gonorrhea

14. Untreated Lymphogranuloma venereum may result in:

- A. Pulmonary fibrosis
- B. Septic shock
- C. Blindness
- D. Meningitis
- E. Genital elephantiasis**

15. A hunter presents with fever and a painful ulcer at the site of a tick bite, followed by swollen lymph nodes. Most likely diagnosis?

- A. Rat-bite fever
- B. Brucellosis
- C. Cat scratch disease
- D. Legionnaires' disease
- E. Tularemia**

16. A microbiology technologist is advised to handle a suspected *Francisella* specimen under special containment because:

- A. It forms spores
- B. It grows rapidly
- C. It produces neurotoxin
- D. It is acid-fast
- E. It is highly infectious via aerosol**

17. A patient develops trench fever during wartime conditions with poor sanitation. Causative organism?

- A. *Bartonella quintana***
- B. *Bartonella henselae*
- C. *Brucella melitensis*
- D. *Legionella pneumophila*
- E. *Streptobacillus moniliformis*

18. A dairy worker develops undulating fever and malaise. Blood cultures grow small oxidase-positive Gram-negative coccobacilli. Most likely pathogen?

- A. *Bartonella henselae*
- B. *Francisella tularensis*
- C. *Legionella pneumophila*
- D. *Brucella abortus***
- E. *Cardiobacterium hominis*

19. A patient bitten by a rat develops fever and arthritis. Blood cultures show filamentous Gram-negative rods. Most likely pathogen?

- A. *Streptobacillus moniliformis*
- B. *Bartonella henselae*
- C. *Francisella tularensis*
- D. *Brucella melitensis*
- E. *Legionella pneumophila*

20. The tetanus toxin acts by:

- A. Blocking acetylcholine release at neuromuscular junction
- B. Inhibiting GABA and glycine release
- C. Increasing cAMP
- D. Causing demyelination
- E. Activating complement

21. Clostridium botulinum toxin causes paralysis by:

- A. Blocking inhibitory neurons
- B. Destroying myelin
- C. Causing sodium channel blockade
- D. Increasing muscle contraction
- E. Preventing acetylcholine release

22. Clostridium perfringens alpha toxin primarily acts as a:

- A. Protease
- B. DNase
- C. Neurotoxin
- D. Lecithinase (phospholipase C)
- E. Superantigen

23. Gas gangrene is most commonly caused by:

- A. *Clostridium tetani*
- B. *Clostridium difficile*
- C. *Clostridium septicum*
- D. *Clostridium botulinum*
- E. *Clostridium perfringens*

24. Infant botulism is most commonly associated with ingestion of:

- A. Raw meat
- B. Honey
- C. Shellfish
- D. Unpasteurized milk
- E. Poultry

25. *Clostridium difficile* infection is strongly associated with:

- A. Recent antibiotic use
- B. Viral infection
- C. Raw meat ingestion
- D. Tick exposure
- E. Mosquito bites

26. Botulinum toxin is best described as:

- A. Heat stable
- B. Heat labile neurotoxin
- C. Endotoxin
- D. Superantigen
- E. Cell wall fragment

27. Which *Clostridium* species is most commonly associated with antibiotic-associated diarrhea?

- A. *C. perfringens*
- B. *C. tetani*
- C. *C. botulinum*
- D. *C. difficile*
- E. *C. septicum*

28. *C. difficile* toxin B primarily:

- A. Activates cAMP
- B. Inhibits ribosomes
- C. Disrupts actin cytoskeleton
- D. Blocks acetylcholine
- E. Causes hemolysis

29. Relapse of *C. difficile* infection is commonly due to:

- A. Viral mutation
- B. Spore persistence
- C. Antibody deficiency
- D. Capsule formation
- E. Vector transmission

30. *Actinomyces israelii* is most commonly associated with:

- A. Toxic shock syndrome
- B. Necrotizing fasciitis
- C. Cervicofacial abscesses with draining sinus tracts
- D. Acute watery diarrhea
- E. Urinary tract infections

31. A classic diagnostic feature of actinomycosis is the presence of:

- A. Sulfur granules
- B. Endospores
- C. Acid-fast staining
- D. Capsule formation
- E. Beta-hemolysis

32. *Cutibacterium acnes* (*Propionibacterium acnes*) is part of the normal flora of the:

- A. Small intestine
- B. Bloodstream
- C. Sebaceous glands of skin
- D. Oropharynx only
- E. Urinary tract

33. *Bacteroides fragilis* is most commonly associated with:

- A. Skin cellulitis
- B. Brain abscess
- C. Intra-abdominal abscess
- D. Pharyngitis
- E. Otitis media

34. *Bacteroides* species are normal flora of the:

- A. Skin
- B. Bloodstream
- C. Upper respiratory tract
- D. Colon
- E. Bladder

35. *Lactobacillus* species are generally:

- A. Strict pathogens
- B. Spore-forming
- C. Obligate intracellular
- D. Opportunistic and usually beneficial
- E. Acid-fast

36. *Bacteroides fragilis* toxin (BFT) primarily:

- A. Causes tetany
- B. Degrades collagen
- C. Inhibits protein synthesis
- D. Disrupts tight junctions in intestinal epithelium
- E. Blocks acetylcholine release

37. A 22-year-old develops fever, abdominal cramps, and bloody diarrhea 2 days after eating undercooked chicken. Stool culture shows curved Gram-negative rods growing at 42°C under microaerophilic conditions. Most likely organism?

- A. *Campylobacter jejuni*
- B. *Salmonella enterica*
- C. *Shigella sonnei*
- D. *Vibrio parahaemolyticus*
- E. *Yersinia enterocolitica*

38. A 45-year-old man presents with epigastric pain relieved by meals. Endoscopy shows a duodenal ulcer. Rapid urease test is positive. Most likely pathogen?

- A. *Helicobacter pylori*
- B. *Campylobacter fetus*
- C. *Escherichia coli*
- D. *Staphylococcus aureus*
- E. *Clostridium difficile*

39. A 35-year-old man develops knee pain and conjunctivitis two weeks after recovering from inflammatory diarrhea caused by a curved Gram-negative rod from undercooked chicken. Which complication has occurred?

- A. Guillain-Barré syndrome
- B. Hemolytic uremic syndrome
- C. Rheumatic fever
- D. Reactive arthritis
- E. Toxic shock syndrome

40. *Mycoplasma pneumoniae* primarily causes:

- A. Lobar pneumonia
- B. Atypical "walking" pneumonia
- C. Necrotizing pneumonia
- D. Aspiration pneumonia
- E. Tuberculosis

41. The primary virulence factor of *Mycoplasma pneumoniae* is:

- A. Exotoxin A
- B. Lipopolysaccharide
- C. P1 adhesin protein
- D. Capsule
- E. Endospore formation

42. *Mycoplasma pneumoniae* spreads primarily via:

- A. Sexual contact
- B. Tick bite
- C. Mosquito vectors
- D. Contaminated food
- E. Respiratory droplets

43. *Ureaplasma urealyticum* is distinguished by its ability to:

- A. Ferment lactose
- B. Grow aerobically only
- C. Form spores
- D. Produce endotoxin
- E. Hydrolyze urea

44. The primary vector of *Rickettsia rickettsii* is:

- A. Louse
- B. Flea
- C. Tick
- D. Mosquito
- E. Mite

45. *Rickettsia rickettsii* primarily infects:

- A. Hepatocytes
- B. Neutrophils
- C. Endothelial cells
- D. Erythrocytes
- E. Lymphocytes

46. *Coxiella burnetii* differs from *rickettsiae* in that it:

- A. Survives in acidic phagolysosomes
- B. Forms spores
- C. Is extracellular
- D. Infects only endothelial cells
- E. Is Gram-positive

47. The infectious form of *Coxiella burnetii* that is environmentally stable is:

- A. Small cell variant
- B. Large cell variant
- C. Reticulate body
- D. Spore
- E. Endotoxin fragment

48. Endothelial damage in rickettsial infections leads to:

- A. Vasculitis
- B. Gas formation
- C. Capsule formation
- D. Hemolysis
- E. Neurotoxicity

49. Which disease is associated with body lice and wartime conditions?

- A. Murine typhus
- B. Rocky Mountain Spotted Fever
- C. Human Monocytic Ehrlichiosis
- D. Q fever
- E. Epidemic typhus

50. A child with tick exposure develops fever and petechial rash including palms and soles. Immediate concern is:

- A. Lyme disease
- B. Rocky Mountain Spotted Fever
- C. Human Granulocytic Anaplasmosis
- D. Human Monocytic Ehrlichiosis
- E. Q fever

51. *Leptospira interrogans* is primarily transmitted through:

- A. Sexual contact
- B. Aerosol inhalation
- C. Contact with water contaminated with animal urine
- D. Tick bite
- E. Fecal-oral transmission

52. Weil disease, causing jaundice, acute kidney failure, hemorrhage, and meningitis, is a severe form of:

- A. Syphilis
- B. Lyme disease
- C. Relapsing fever
- D. Leptospirosis
- E. Yaws

53. *Borrelia burgdorferi* outer surface protein C (OspC) is important in:

- A. Early infection in mammals
- B. Capsule formation
- C. Spore formation
- D. Neurotoxin production
- E. Acid-fast staining

54. Which organism causes chronic neurologic symptoms years after infection if untreated?

- A. *Leptospira interrogans*
- B. *Treponema pallidum*
- C. *Borrelia burgdorferi*
- D. *Borrelia recurrentis*
- E. *Coxiella burnetii*

55. A woman develops a diffuse maculopapular rash involving palms and soles weeks after a painless ulcer resolved. Most likely diagnosis?

- A. Primary syphilis
- B. Secondary syphilis**
- C. Tertiary syphilis
- D. Lyme disease
- E. Leptospirosis

56. A hiker develops expanding erythematous rash with central clearing after tick exposure. Most likely organism?

- A. *Treponema pallidum*
- B. *Borrelia burgdorferi***
- C. *Leptospira interrogans*
- D. *Borrelia recurrentis*
- E. *Rickettsia rickettsii*

57. A child in the northeastern United States presents with facial nerve palsy weeks after tick bite. Most likely organism?

- A. *Treponema pallidum*
- B. *Staphylococcus aureus*
- C. *Leptospira interrogans*
- D. *Cardiobacterium hominis*
- E. *Borrelia burgdorferi***

58. Members of the genus *Chlamydia* are best described as:

- A. Gram-positive spore-forming rods
- B. Motile curved Gram-negative rods
- C. Facultative intracellular cocci
- D. Acid-fast bacilli
- E. Obligate intracellular Gram-negative bacteria lacking peptidoglycan**

59. The metabolically active replicative form of *Chlamydia* is the:

- A. Elementary body
- B. Reticulate body**
- C. L-form
- D. Spore
- E. Capsule

60. Lymphogranuloma venereum (LGV) is caused by:

- A. Serovars A–C
- B. Serovars D–K
- C. Serovars L1–L3**
- D. *C. pneumoniae*
- E. *C. psittaci*

61. Trachoma is transmitted primarily by:

- A. Sexual contact
- B. Respiratory droplets
- C. Tick bite
- D. Direct contact and flies
- E. Contaminated water

62. Several guests at a convention develop severe pneumonia after staying at the same hotel. Laboratory testing reveals a Gram-negative rod requiring cysteine for growth. Which pathogen is responsible?

- A. *Bordetella pertussis*
- B. *Francisella tularensis*
- C. *Brucella abortus*
- D. *Bartonella quintana*
- E. *Legionella pneumophila*

63. A laboratory worker develops fever and painful lymphadenopathy after accidentally inhaling aerosolized rabbit tissue during dissection. Most likely organism?

- A. *Brucella melitensis*
- B. *Francisella tularensis*
- C. *Bartonella henselae*
- D. *Legionella pneumophila*
- E. *Streptobacillus moniliformis*

64. A teenager develops a papule at the site of a cat scratch followed by tender axillary lymphadenopathy. Most likely pathogen?

- A. *Bartonella henselae*
- B. *Brucella abortus*
- C. *Streptobacillus moniliformis*
- D. *Francisella tularensis*
- E. *Cardiobacterium hominis*

65. *Mycoplasma pneumoniae* is best classified as:

- A. Gram-positive coccus
- B. Gram-negative rod
- C. Cell wall-deficient bacterium
- D. Acid-fast bacillus
- E. Spore-forming rod

66. *Mycoplasma* are intrinsically resistant to:

- A. Tetracyclines
- B. Macrolides
- C. Fluoroquinolones
- D. Beta-lactam antibiotics
- E. Aminoglycosides

67. The most common bacterial cause of nongonococcal urethritis is:

- A. *Neisseria gonorrhoeae*
- B. *Ureaplasma urealyticum*
- C. *Treponema pallidum*
- D. *Mycoplasma pneumoniae*
- E. *Chlamydia trachomatis*

68. Untreated genital chlamydia can lead to:

- A. Toxic shock
- B. Pelvic inflammatory disease
- C. Gas gangrene
- D. Tetanus
- E. Cholera

69. Which sequela (complication that arises) is classically associated with *Campylobacter jejuni* infection?

- A. Rheumatic fever
- B. Toxic megacolon
- C. Guillain-Barré syndrome
- D. Hemolytic uremic syndrome
- E. Myocarditis

70. The key virulence factor enabling *Helicobacter pylori* survival in gastric acid is:

- A. Hemolysin
- B. Urease
- C. Capsule
- D. Superantigen
- E. Enterotoxin

71. A 30-year-old man develops unilateral painless genital ulcer followed by painful inguinal nodes. Diagnosis?

- A. Syphilis
- B. Lymphogranuloma venereum
- C. Herpes
- D. Gonorrhea
- E. Psittacosis