NBME Microbiology Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

Copyright **1**

Table of Contents **2**

Introduction **3**

How to Use This Guide **4**

Questions **5**

Answers **8**

Explanations **10**

Next Steps **16**

Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- **Practice answering questions under realistic conditions,**
- **Improve accuracy and speed,**
- **Review explanations to strengthen weak areas, and**
- **Approach the exam with greater confidence.**

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here’s how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don’t just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There’s no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

1. **The leading cause of sepsis and meningitis in newborns is which organism?**

   A. Escherichia coli

   B. Streptococcus agalactiae

   C. Listeria monocytogenes

   D. Staphylococcus aureus

2. **Neonatal infection is most reliably indicated by the presence of which immunoglobulin that does not cross the placenta?**

   A. IgG

   B. IgM

   C. IgA

   D. IgE

3. **Lactobacillus in the vagina contributes to an acidic environment by producing lactic acid. Which statement is true?**

   A. It is Gram-negative bacilli.

   B. It is not part of the normal vaginal flora.

   C. It is Gram-positive bacilli and part of normal vaginal flora.

   D. It causes bacterial vaginosis.

4. **Which whipworm infection is often asymptomatic or causes loose stools?**

   A. Trichuris trichiura

   B. Enterobius vermicularis

   C. Ascaris lumbricoides

   D. Ancylostoma duodenale

5. **Kaposi sarcoma is associated with which human herpesvirus?**

   A. EBV

   B. HHV-8

   C. HHV-6

   D. HSV-2

6. Lymphogranuloma venerum is caused by which organism?

- **A. Neisseria gonorrhoeae**
- **B. Treponema pallidum**
- **C. Chlamydia trachomatis**
- **D. Haemophilus ducreyi**

7. Which statement accurately describes Escherichia coli strains associated with neonatal meningitis?

- **A. They are non-encapsulated.**
- **B. They lack fimbriae.**
- **C. They do not cause meningitis.**
- **D. They are encapsulated with a K1 antigen.**

8. Which organism causes liver abscesses with anchovy paste and flask-shaped ulcers in the intestine, often acquired from contaminated water?

- **A. Giardia lamblia**
- **B. Entamoeba histolytica**
- **C. Cryptosporidium**
- **D. Toxoplasma gondii**

9. Mycoplasma pneumoniae is associated with which features?

- **A. Typical pneumonia with productive cough**
- **B. Atypical pneumonia with nonproductive cough and cold agglutinins**
- **C. Gram-positive cocci forming clusters**
- **D. Response to penicillin due to a rigid cell wall**

10. Which of the following vaccines is a live attenuated vaccine?

- **A. MMR, Varicella, Rotavirus**
- **B. Polio vaccine (IPV)**
- **C. Hepatitis B vaccine**
- **D. Pneumococcal vaccine**

Answers

1. B
2. B
3. C
4. A
5. B
6. C
7. D
8. B
9. B
10. A

Explanations

1. The leading cause of sepsis and meningitis in newborns is which organism?

A. Escherichia coli

B. Streptococcus agalactiae

C. Listeria monocytogenes

D. Staphylococcus aureus

Group B Streptococcus (Streptococcus agalactiae) is the leading cause of neonatal sepsis and meningitis because it commonly colonizes the maternal vagina and rectum and can be transmitted to the baby during delivery. When a newborn acquires this organism, it can invade the bloodstream and meninges, leading to sepsis and meningitis in the first days of life. A helpful lab clue is the CAMP test, where GBS produces enhanced beta-hemolysis when grown with Staphylococcus aureus, creating a distinctive arrowhead pattern. Clinically, this is why prenatal screening late in pregnancy and intrapartum antibiotics for colonized mothers or those with risk factors have dramatically reduced early-onset neonatal disease. While other organisms like E. coli and Listeria monocytogenes can cause neonatal infections, they are not more common causes than GBS, and Staphylococcus aureus is not the primary agent of neonatal sepsis or meningitis.

2. Neonatal infection is most reliably indicated by the presence of which immunoglobulin that does not cross the placenta?

A. IgG

B. IgM

C. IgA

D. IgE

Neonatal infection is best signaled by an immunoglobulin that the baby itself makes, not one inherited from the mother. IgG crosses the placenta and can be found in the newborn from maternal sources, which means its presence doesn't prove infection in the infant. In contrast, IgM is a large molecule that cannot cross the placental barrier, so detecting IgM in a newborn indicates the infant has produced it in response to an infection. IgA and IgE don't serve as reliable indicators of neonatal infection in this context.

3. Lactobacillus in the vagina contributes to an acidic environment by producing lactic acid. Which statement is true?

A. It is Gram-negative bacilli.

B. It is not part of the normal vaginal flora.

C. It is Gram-positive bacilli and part of normal vaginal flora.

D. It causes bacterial vaginosis.

Lactobacillus in the vagina helps keep things acidic by producing lactic acid, which creates an environment that inhibits many pathogens. These bacteria are Gram-positive rods and normally colonize the vaginal tract in reproductive-age women. Their presence and acid production, sometimes along with hydrogen peroxide and bacteriocins, form a protective, microbiota-balanced state. The correct statement reflects both features: they are Gram-positive bacilli and they are part of the normal vaginal flora. Why the other ideas don't fit: lactobacilli aren't Gram-negative, so that label wouldn't be accurate. They are indeed part of the normal vaginal flora, not a nonresident. And they don't cause bacterial vaginosis; BV is associated with overgrowth of anaerobes when lactobacilli are depleted and the pH rises, rather than caused by lactobacilli themselves.

4. Which whipworm infection is often asymptomatic or causes loose stools?

A. Trichuris trichiura

B. Enterobius vermicularis

C. Ascaris lumbricoides

D. Ancylostoma duodenale

Infections with whipworms tend to be mild or even asymptomatic, especially when worm burden is low. The whipworm, Trichuris trichiura, lives in the large intestine and irritates the mucosa just enough to cause loose stools in milder cases. When the infection is heavier, it can lead to more noticeable symptoms like persistent diarrhea and abdominal discomfort, and in children, rectal prolapse can occur. The other parasites listed are not whipworms and present differently: pinworm mainly causes perianal itching; Ascaris lumbricoides can cause obstruction or respiratory symptoms with heavy infection; hookworms (Ancylostoma duodenale) commonly cause iron-deficiency anemia and fatigue due to blood loss.

5. Kaposi sarcoma is associated with which human herpesvirus?

A. EBV

B. HHV-8

C. HHV-6

D. HSV-2

Kaposi sarcoma is driven by infection with a specific human herpesvirus known as Kaposi sarcoma-associated herpesvirus (KSHV), also called HHV-8. This virus persists in infected cells and expresses proteins that promote endothelial cell proliferation and new blood vessel formation, leading to the characteristic violaceous lesions. The cancer tends to appear or worsen in settings of immunosuppression, such as AIDS, where the oncogenic activity of HHV-8 can drive tumor growth. The other viruses listed are linked to different diseases—EBV is associated with Burkitt lymphoma and nasopharyngeal carcinoma, HHV-6 with roseola, and HSV-2 with genital herpes—so HHV-8 is the specific association with Kaposi sarcoma.

6. Lymphogranuloma venerum is caused by which organism?

A. Neisseria gonorrhoeae

B. Treponema pallidum

C. Chlamydia trachomatis

D. Haemophilus ducreyi

Lymphogranuloma venereum is caused by Chlamydia trachomatis, specifically the L1–L3 serovars. This organism is an obligate intracellular bacterium that cycles between infectious elementary bodies and replicating reticulate bodies. Infection often starts with a small, sometimes unnoticed genital lesion, and weeks later leads to painful inguinal lymphadenopathy (buboes) and possible systemic symptoms. This pattern helps distinguish it from other sexually transmitted infections: Neisseria gonorrhoeae causes gonorrhea with purulent discharge, Treponema pallidum causes syphilis with a painless chancre and potential systemic disease, and Haemophilus ducreyi causes chancroid with a painful ulcer and tender nodes. Diagnosis is typically by nucleic acid amplification testing from the lesion or regional lymph nodes, and standard treatment options include doxycycline or azithromycin.

7. Which statement accurately describes Escherichia coli strains associated with neonatal meningitis?

A. They are non-encapsulated.

B. They lack fimbriae.

C. They do not cause meningitis.

D. They are encapsulated with a K1 antigen.

Neonatal meningitis–associated E. coli are defined by carrying a polysaccharide capsule of the K1 type. This capsule is a powerful virulence factor because it is antiphagocytic and helps the bacteria survive in the bloodstream and cross into the central nervous system, leading to meningitis in newborns. The K1 capsule also resembles host polysialic acid, which helps the bacteria evade immune detection. Non-encapsulated strains are less capable of causing meningitis, and these particular bacteria do cause meningitis in neonates, so statements claiming they do not would be inaccurate. Fimbriae can contribute to adhesion in many E. coli infections, but their presence or absence is not the defining trait of strains that cause neonatal meningitis; the K1 capsule is the key feature that links these strains to meningitis in newborns.

8. Which organism causes liver abscesses with anchovy paste and flask-shaped ulcers in the intestine, often acquired from contaminated water?

A. Giardia lamblia

B. Entamoeba histolytica

C. Cryptosporidium

D. Toxoplasma gondii

Entamoeba histolytica is an invasive intestinal protozoan acquired by ingesting cysts in contaminated water or food. In the colon, trophozoites penetrate the mucosa and create flask-shaped ulcers as they invade deeper tissue. Some trophozoites reach the portal circulation and seed the liver, forming amebic liver abscesses whose classic aspirate is described as anchovy paste due to necrotic debris and inflammatory cells. This combination of invasive colitis with flask-shaped ulcers and liver abscesses is characteristic and linked to contaminated-water transmission. Other organisms like Giardia lamblia cause noninvasive intestinal symptoms without liver abscess; Cryptosporidium causes severe watery diarrhea in immunocompromised individuals; Toxoplasma gondii typically affects the CNS and eyes, not producing amebic liver abscess or flask-shaped ulcers.

9. Mycoplasma pneumoniae is associated with which features?

A. Typical pneumonia with productive cough

B. Atypical pneumonia with nonproductive cough and cold agglutinins

C. Gram-positive cocci forming clusters

D. Response to penicillin due to a rigid cell wall

Mycoplasma pneumoniae causes an atypical pneumonia, typically presenting with a dry, nonproductive cough and often cold agglutinins—IgM antibodies that cause RBC agglutination at cooler temperatures. A defining feature is that this organism lacks a cell wall, so it does not Gram stain and is resistant to beta-lactam antibiotics like penicillin, which target cell wall synthesis. This combination—atypical pneumonia with a nonproductive cough and cold agglutinins—best fits the scenario. In contrast, typical lobar pneumonia presents with a productive cough, Gram-positive cocci in clusters describe Staphylococcus aureus, and penicillin would not be effective due to the absence of a cell wall in Mycoplasma.

10. Which of the following vaccines is a live attenuated vaccine?

A. MMR, Varicella, Rotavirus

B. Polio vaccine (IPV)

C. Hepatitis B vaccine

D. Pneumococcal vaccine

Live attenuated vaccines use weakened forms of the pathogen that can still replicate in the body, provoking a strong and long-lasting immune response that mimics natural infection. The vaccines MMR, Varicella, and Rotavirus are all live attenuated vaccines, since they contain weakened viruses that replicate to stimulate immunity. In contrast, the poliovirus vaccine listed is inactivated, the hepatitis B vaccine is a recombinant protein subunit, and the pneumococcal vaccines are polysaccharide-based (conjugate or plain) rather than live organisms. Therefore, the live attenuated group is the correct choice.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://nbmemicrobiology.examzify.com

We wish you the very best on your exam journey. You've got this!