

Advanced Microbiology Challenge

Microbiology · Answer Key · 18 Questions

1. Which bacterial structure, composed of polysaccharides or polypeptides, specifically serves to protect the pathogen from phagocytosis?

A) Capsule

B) Pilus

C) Mesosome

D) Flagellum

2. During the process of bacterial conjugation, which genetic element is transferred from the donor to the recipient cell?

A) Capsid

B) Plasmid

C) Ribosome

D) Centriole

3. What is the primary component of the cell wall in most Fungi, distinguishing them from the peptidoglycan-based walls of bacteria?

A) Cellulose

B) Lignin

C) Chitin

D) Pectin

4. Which phase of the bacterial growth curve is characterized by no net increase in population size because the rate of cell division equals the rate of cell death?

A) Lag phase

B) Log phase

C) Stationary phase

D) Decline phase

5. Viruses that exclusively infect bacteria are known as what?

A) Bacteriophages

B) Retroviruses

C) Viroids

D) Prions

6. Which staining technique is used to identify bacteria with high concentrations of mycolic acid in their cell walls, such as *Mycobacterium tuberculosis*?

- A) Gram stain
- B) Acid-fast stain**
- C) Endospore stain
- D) Negative stain

7. What term describes a microorganism that requires high concentrations of salt to survive and thrive?

- A) Thermophile
- B) Barophile
- C) Halophile**
- D) Acidophile

8. In viral replication, what is the term for the process where a virus integrates its genetic material into the host cell's genome without immediately causing cell death?

- A) Lytic cycle
- B) Lysogenic cycle**
- C) Binary fission
- D) Transformation

9. Which organelle do eukaryotic microbes possess that is entirely absent in prokaryotic organisms?

- A) Ribosome
- B) Cytoplasm
- C) Mitochondrion**
- D) Plasma membrane

10. What is the main function of the bacterial endospore?

- A) Reproduction
- B) Photosynthesis
- C) Survival in extreme conditions**
- D) Motility

11. Which group of microorganisms is responsible for the process of nitrogen fixation in root nodules of leguminous plants?

- A) Rhizobium**
- B) Streptococcus
- C) Candida
- D) Influenza

12. What is the defining characteristic of a 'facultative anaerobe'?

- A) It requires oxygen to survive
- B) It dies in the presence of oxygen
- C) It can grow with or without oxygen**
- D) It strictly uses fermentation

13. Which biochemical pathway do yeast perform in the absence of oxygen to produce ethanol and carbon dioxide?

- A) Krebs cycle
- B) Fermentation**
- C) Electron transport chain
- D) Glycolysis

14. The study of the interactions between microbes and the human immune system is known as what?

- A) Mycology
- B) Immunology**
- C) Phycology
- D) Parasitology

15. Which enzyme, found in tears and saliva, breaks down the peptidoglycan layer of bacterial cell walls?

- A) Amylase
- B) Pepsin
- C) Lysozyme**
- D) Lipase

16. What is the primary mode of genetic variation in bacteria that involves the uptake of 'naked' DNA from the surrounding environment?

- A) Transduction
- B) Conjugation
- C) Transformation**
- D) Mutation

17. Which microbial structure is responsible for bacterial motility and is composed of the protein flagellin?

- A) Cilia
- B) Flagellum**
- C) Fimbriae
- D) Capsid

18. What are infectious protein particles that lack nucleic acids and are responsible for diseases like Creutzfeldt-Jakob disease?

A) Viroids

B) Prions

C) Plasmids

D) Capsomeres