

Chapter 3 Test

Objective Questions

- d
Analysis
1. Which of the following is *not* equal to 1 m?
a. $10^6 \mu\text{m}$
b. 10^9 nm
c. 10 dm
d. 100 mm
e. None of the above
- c
Analysis
2. What structure does light pass through after leaving the condenser in a compound light microscope?
a. Ocular lens
b. Objective lens
c. Specimen
d. Illuminator
- a
Recall
3. Which of the following pairs is mismatched?
a. Gram-negative bacteria—negative stain
b. Iodine—mordant
c. Alcohol-acetone—decolorizer
d. Acid-alcohol—decolorizer
e. None of the above
- c
Recall
4. Place the steps of the Gram stain in the correct order:
1-Alcohol-acetone; 2-Crystal violet; 3-Safranin; 4-Iodine.
a. 1-2-3-4
b. 2-1-4-3
c. 2-4-1-3
d. 4-3-2-1
e. 1-3-2-4
- c
Recall
5. Which of the following pairs is mismatched?
a. Alcohol-acetone—decolorizer
b. Crystal violet—basic dye
c. Safranin—acid dye
d. Iodine—mordant
e. None of the above
- a
Recall
6. The counterstain in the acid-fast stain is
a. A basic dye.
b. An acid dye.
c. A negative stain.
d. A mordant.
e. Necessary to determine acid-fast cells.

d
Recall

7. The purpose of a mordant in the Gram stain is
- To remove the simple stain.
 - To make the bacterial cells larger.
 - To make the flagella visible.
 - To prevent the crystal violet from leaving the cells.
 - None of the above.

c
Recall

8. Place the following steps in the correct sequence:
1-Staining; 2-Making a smear; 3-Fixing.
- 1-2-3
 - 3-2-1
 - 2-3-1
 - 1-3-2
 - The order doesn't matter

e
Recall

9. The best use of a negative stain is
- To determine cell size.
 - To determine cell shape.
 - To determine Gram reaction.
 - To see endospores.
 - a and b

Recall

- Match these microscopes with the descriptions in questions 10 through 15.
Choices may be used once, more than once, or not at all.
- Compound light microscope
 - Phase-contrast microscope
 - Darkfield microscope
 - Fluorescence microscope
 - Electron microscope

e

10. Simple staining is often necessary to improve contrast.

b

11. Used to see internal structures of cells in a natural state.

d

12. Uses an ultraviolet light source.

e

13. Achieves the highest magnification and greatest resolution.

e

14. The observer does not look at an image through a lens.

c

15. Produces an image of a light cell against a dark background; internal structures are not visible.

e
Analysis

16. Which of the following is *not* correct?
- $1 \mu\text{m} = 10^{-6} \text{ m}$
 - $1 \text{ nm} = 10^{-9} \text{ m}$
 - $1 \mu\text{m} = 10^3 \text{ nm}$
 - $1 \mu\text{m} = 10^{-3} \text{ mm}$
 - $1 \text{ nm} = 10^{-6} \mu\text{m}$

c
Understanding

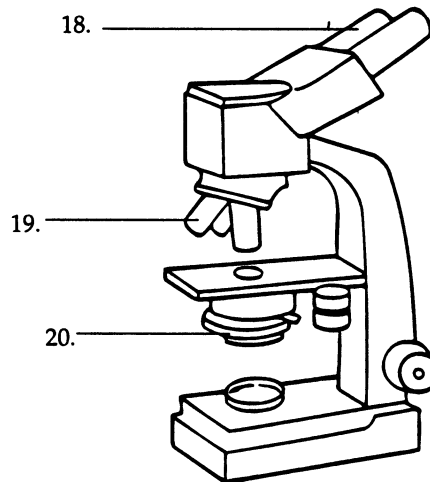
17. The counterstain in the Gram stain is
- A negative stain.
 - A mordant.
 - A basic dye.
 - An acid dye.
 - Necessary to determine the Gram reaction.

Recall

Use these choices to identify the parts of the microscope indicated for questions 18 through 20. Choices may be used once, more than once, or not at all.

- Illuminator
- Condenser
- Ocular lens
- Objective lens

c
d
b
18.
19.
20.



Recall

Match these microscopes with the descriptions in questions 21 through 24. Choices may be used once, more than once, or not at all.

- Compound light microscope
- Phase-contrast microscope
- Darkfield microscope
- Fluorescence microscope
- Electron microscope

- c 21. The light that hits the specimen is scattered and does not come directly from the light source.
- d 22. Used to observe a specimen that emits light when illuminated with an ultra-violet light.
- e 23. Does not use a light.
- b 24. Takes advantage of differences in the refractive indexes of cell structures.

Analysis

Place the letter corresponding to the correct color in the answer blank for questions 25 through 29. Choices may be used once, more than once, or not at all.

- a. Purple
b. Red
c. Colorless
d. Brown
e. None of the above
- a 25. The appearance of gram-positive bacteria after addition of the first dye in the Gram stain.
- a 26. The appearance of gram-negative bacteria after addition of the mordant in the Gram stain.
- c 27. The appearance of gram-negative bacteria after addition of the decolorizing agent in the Gram stain.
- a 28. The appearance of gram-positive bacteria after adding the counterstain in the Gram stain.
- b 29. The appearance of gram-negative bacteria after completing the Gram stain.
- d
Recall 30. *Bdellovibrio* are unusual bacteria because they
a. Phagocytize other bacteria.
b. Live inside another bacterium as a parasite.
c. Kill nearby bacteria.
d. Enter and digest other bacteria.
e. Release their cellular contents to the outside.
- d
Analysis 31. What is the total magnification of a chloroplast viewed with a 10× ocular lens and a 45× objective lens?
a. 10×
b. 45×
c. 100×
d. 450×
e. None of the above

- e
Analysis
32. You suspect a 100 nm structure is present in a cell. Which of the following provides the lowest magnification that you can use to see this structure?
- Brightfield microscope
 - Darkfield microscope
 - Transmission electron microscope
 - Phase-contrast microscope
 - Scanning electron microscope
- Recall
- Use the following choices to answer questions 33 through 36. Choices may be used once, more than once, or not at all.
- Fluorescence microscope
 - Phase-contrast microscope
 - Darkfield microscope
 - DIC microscope
 - None of the above
- d
33. Uses two beams of light to produce a three-dimensional, color image.
- b
34. Used to see intracellular detail.
- c
35. Image looks like a negative stain.
- e
36. Used to see detail of a 300 nm virus.
- c
Analysis
37. Assume you stain *Bacillus* by applying malachite green with heat and then counterstaining with safranin. Through the microscope, the green structures are
- Cell walls.
 - Capsules.
 - Endospores.
 - Flagella.
 - Can't tell.
- b
Understanding
38. Cells are differentiated after which step in the Gram stain?
- Safranin
 - Alcohol-acetone
 - Iodine
 - Crystal violet
- d
Analysis
39. You find colorless areas in cells in a Gram-stained smear. What should you do next?
- An acid-fast stain
 - A flagella stain
 - A capsule stain
 - An endospore stain
 - A simple stain
- a
Analysis
40. What Gram reaction do you expect from acid-fast bacteria?
- Gram-positive
 - Gram-negative
 - Both gram-positive and gram-negative
 - Can't tell

d
Recall

41. Bacterial smears are fixed before staining to
- Kill the bacteria.
 - Affix the cells to the slide.
 - Make their walls permeable.
 - a and b.
 - All of the above.

c
Recall

42. The resolution of a microscope can be improved by changing the
- Condenser.
 - Fine adjustment.
 - Wavelength of light.
 - Diaphragm.
 - Coarse adjustment.

c
Recall

43. Van Leeuwenhoek's microscope was a(n)
- Electron microscope.
 - Phase-contrast microscope.
 - Simple microscope.
 - Confocal microscope.
 - None of the above.

b
Recall

44. The purpose of the ocular lens is to
- Improve resolution.
 - Magnify the image from the objective lens.
 - Decrease the refractive index.
 - Increase the light.
 - None of the above.

a
Analysis

45. Which of the following pairs is mismatched?
- Fluorescence microscope—uses fluorescent light source
 - Brightfield microscope—used to view stained specimens
 - Confocal microscope—produces a three-dimensional image
 - Scanning electron microscope—used to view surface of specimen
 - Scanning tunneling microscope—used to visualize DNA