Test Bank for Microbiology Fundamentals A Clinical Approach 3rd Cowan

Microbiology Fundamentals: A Clinical Approach, 3e **(Cowan)**
Chapter 2 Tools of the Laboratory: Methods for the Culturing and Microscopic Analysis of Microorganisms

1) The Five I's of studying microorganisms include all of the following except _____.
A) inoculation
B) incubation
C) infection
D) isolation
E) identification

Answer: C
Section: 02.01
Topic: Identifying Microorganisms; Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

2) The term that refers to the purposeful addition of microorganisms into a laboratory nutrient medium is _____.
A) isolation
B) inoculation
C) immunization
D) infection
E) contamination

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

3) A pure culture contains _____.
A) only one species of microorganism
B) only bacteria
C) a variety of microbes from one source
D) a variety of species from the same genus
E) None of the choices are correct.

Answer: A
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

4) The correct microbiological term for the tiny sample of specimen that is put into a nutrient medium in order to produce a culture is the _____.
A) colony
B) inoculum
C) streak
D) loop
E) incubator

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

5) Which of the following is essential for development of discrete, isolated colonies?
A) Broth medium
B) Differential medium
C) Selective medium
D) Solid medium
E) Assay medium

Answer: D
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

6) Which method often results in colonies developing down throughout the agar along with some colonies on the surface?
A) Streak plate
B) Spread plate
C) Pour plate
D) All of the choices are correct.
E) None of the choices are correct.

Answer: C
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

7) What type of isolation technique is most effective for the majority of applications?
A) Pour plate
B) Streak plate
C) Spread plate
D) Loop dilution
E) Culture plate

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

8) Which of the following will result when 1% to 5% agar is added to nutrient broth, boiled, and cooled?
A) A pure culture
B) A mixed culture
C) A solid medium
D) A liquid medium
E) A contaminated medium

Answer: C
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

9) Agar is an important component of media because _____.
A) bacteria require agar to grow
B) agar inhibits mold growth
C) agar provides a solid surface for bacterial growth
D) agar prevents contamination
E) All of the choices are correct.

Answer: C
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
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10) The three physical forms of laboratory media are _____.
A) solid, liquid, and gas
B) solid, semisolid, and liquid
C) streak plate, pour plate, and broth
D) aerobic, anaerobic, and micro aerobic
E) None of the choices are correct.

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

11) Which of the following is not an inoculating tool?
A) Petri dish
B) Loop
C) Needle
D) Pipette
E) Swab

Answer: A
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
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12) Agar is a complex polysaccharide that comes from a(n) _____.
A) green plant
B) fungus
C) mold
D) algae
E) euglena

Answer: D
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
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13) Which of the following is not a benefit of agar as a solid medium?
A) Has flexibility
B) Holds moisture
C) Can be inoculated and poured at a temperature that is not harmful
D) Is solid at room temperature
E) Is digested by most microbes

Answer: E
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
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14) A nutrient medium that has all of its chemical components identified, and their precise concentrations known and reproducible, would be termed _____.
A) a complex media
B) a reducing media
C) an enriched media
D) a chemically defined media
E) None of the choices are correct.

Answer: D
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

15) A nutrient medium that contains at least one ingredient that is NOT chemically definable would be termed _____.
A) complex
B) reducing
C) enriched
D) synthetic
E) minimal

Answer: A
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

16) All of the following are examples of different types of microbiological media except _____.
A) broth
B) enriched
C) agar
D) petri dish
E) selective

Answer: D
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

17) Which type of media would be the best choice when shipping a sample of bacteria to a laboratory to be tested from a satellite office site?
A) Transport
B) EMB
C) Blood
D) Thioglycollate
E) General purpose

Answer: A
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

18) A microbiologist inoculates *Staphylococcus epidermidis* and *Escherichia coli* into a culture medium. Following incubation, only the *E. coli* grows in the culture. What is the most likely explanation?
A) The microbiologist used too much inoculum.
B) The culture is contaminated.
C) The incubation temperature was incorrect.
D) The culture medium must be selective.
E) The culture medium must be differential.

Answer: D
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 07 Scientific Thinking; Module 08 Microbiology Skills
ASM Objective: 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods and apply these methods to analogous situations.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

19) A common medium used for growing fastidious bacteria is _____.
A) blood agar
B) trypticase soy agar
C) mannitol salt agar
D) MacConkey medium
E) a reducing medium

Answer: A
Section: 02.01
Topic: Culturing Microorganisms; Microbial Growth and Nutrition
Bloom's: 01. Remember
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

20) A reducing medium contains _____.
A) sugars that can be fermented
B) extra oxygen
C) hemoglobin, vitamins, or other growth factors
D) substances that remove oxygen
E) inhibiting agents

Answer: D
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

21) Which type of medium is able to distinguish different species or types of microorganisms based on an observable change in the colonies or in the medium?
A) Differential
B) Selective
C) Enumeration
D) Enriched
E) Reducing

Answer: A
Section: 02.01
Topic: Identifying Microorganisms; Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

22) Differential media results in which of the following growth characteristics?
A) Different color colonies
B) Different media color post incubation
C) Precipitates
D) Gas bubbles
E) All of the choices are correct.

Answer: E
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

23) A reducing media is used to culture
A) fastidious organisms.
B) aerobic organisms.
C) anaerobic organisms.
D) any pathogenic organisms.
E) None of the choices are correct.

Answer: C
Section: 02.01
Topic: Culturing Microorganisms; Microbial Growth and Nutrition
Bloom's: 02. Understand
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.; 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

24) For which bacterial genus does mannitol salt agar differentiate between species?
A) *Salmonella*
B) *Streptococcus*
C) *Neisseria*
D) *Staphylococcus*
E) *Escherichia*

Answer: D
Section: 02.01
Topic: Identifying Microorganisms; Culturing Microorganisms
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

25) A microbiologist must culture a patient's feces for intestinal pathogens. Which of the following would likely be present in selective media for analyzing this fecal specimen?
A) NaCl
B) Sheep red blood cells
C) Bile salts
D) Thioglycollic acid
E) Peptone

Answer: C
Section: 02.01
Topic: Identifying Microorganisms; Culturing Microorganisms
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

26) Bacteria that require special growth factors and complex nutrients are termed _____.
A) aerobic
B) anaerobic
C) fastidious
D) microaerophilic
E) autotrophic

Answer: C
Section: 02.01
Topic: Culturing Microorganisms; Microbial Growth and Nutrition
Bloom's: 01. Remember
ASM Topic: Module 03 Metabolic Pathways
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.

27) A microbiologist inoculates *Staphylococcus aureus* into a culture medium. Following incubation, both *Staphylococcus aureus* and *Staphylococcus epidermidis* are determined to be growing in this culture. What is the most likely explanation?
A) The microbiologist used too much inoculum.
B) The culture is contaminated.
C) The incubation temperature was incorrect.
D) The culture medium must be selective.
E) The culture medium must be differential.

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 07 Scientific Thinking; Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 07.01b Ability to apply the process of science: Analyze and interpret results from a variety of microbiological methods and apply these methods to analogous situations.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

28) Newly inoculated cultures must be _____ at a specific temperature to encourage growth.
A) streaked
B) poured
C) incubated
D) contaminated
E) All of the choices are correct.

Answer: C
Section: 02.01
Topic: Culturing Microorganisms; Microbial Growth and Nutrition
Bloom's: 01. Remember
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.; 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, or biological means.; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

29) A rod-shaped bacterium is measured as 0.3 micrometers (μm) in length using an ocular micrometer. Your instructor wants you to report the length in millimeters (mm) to test your understanding of metric conversions. What is the length of the organism in millimeters?
A) 0.0003 mm
B) 300 mm
C) 0.03 mm
D) 3 mm

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 02. Understand
ASM Topic: Module 07 Scientific Thinking
ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical reasoning and graphing skills to solve problems in microbiology.

30) An enveloped virus measures 0.02 micrometers (μm) in diameter. What is the diameter of this virus in nanometers (nm)?
A) 20 nm
B) 0.00002 nm
C) 2 nm
D) 0.2 nm

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 02. Understand
ASM Topic: Module 07 Scientific Thinking
ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical reasoning and graphing skills to solve problems in microbiology.

31) The _____ of the microscope holds and allows selection of the objective lenses.
A) stage
B) condenser
C) objective
D) ocular
E) nosepiece

Answer: E
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

32) Which of the following magnifies the specimen to produce its real image?
A) Condenser
B) Objective lens
C) Ocular lens
D) Body
E) Nosepiece

Answer: B
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

33) Which of the following magnifies the specimen to produce its virtual image?
A) Objective lens
B) Ocular lens
C) Condenser
D) Body
E) Iris diaphragm

Answer: B
Section: 02.02
Topic: Microscopy
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34) Which of the following controls the amount of light entering the specimen?
A) Objective lens
B) Ocular lens
C) Condenser
D) Body
E) Iris diaphragm

Answer: E
Section: 02.02
Topic: Microscopy
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35) If a microbiologist is studying a specimen at a total magnification of 950x, what is the magnifying power of the objective lens if the ocular lens is 10x?
A) 100x
B) 950x
C) 85x
D) 850x
E) 95x

Answer: E
Section: 02.02
Topic: Microscopy
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

36) Magnification is achieved in a compound microscope through the initial magnification of the specimen by the _____ lens. This image is then projected to the _____ lens that will further magnify the specimen to form a virtual image received by the eye.
A) ocular; objective
B) scanning; objective
C) objective; ocular
D) ocular; oil
E) None of the choices are correct.

Answer: C
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

37) Which of the following characteristics refers to the microscope's ability to show two separate entities as separate and distinct?
A) Resolving power
B) Magnification
C) Refraction
D) All of the choices are correct.
E) None of the choices are correct.

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

38) All of the following are diameters of cells that would be resolved in a microscope with a 0.2 µm limit of resolution except _____.
A) 0.2 µm
B) 0.2 mm
C) 0.1 µm
D) 0.3 µm
E) 2.0 µm

Answer: C
Section: 02.02
Topic: Microscopy
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

39) The type of microscope in which you would see brightly illuminated specimens against a black background is _____.
A) bright field
B) dark field
C) phase contrast
D) fluorescence
E) electron

Answer: B
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

40) Which type of microscope shows cells against a bright background but also differentiates intracellular structures of unstained cells based on their varying densities?
A) Bright field
B) Dark field
C) Phase contrast
D) Differential interference
E) Electron

Answer: C
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

41) Which type of microscope is the most widely used and shows cells against a bright background?
A) Bright field
B) Dark field
C) Phase contrast
D) Fluorescence
E) Electron

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

42) All of the following pertain to the fluorescence microscope except _____.
A) it uses electrons to produce a specimen image
B) it is a type of compound microscope
C) it requires the use of dyes like acridine and fluorescein
D) it is commonly used to diagnose certain infections
E) it requires an ultraviolet radiation source

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

43) A confocal scanning microscope _____.
A) uses visible light to form a specimen image
B) shows three-dimensional cell images from the cell surface to the middle of the cell
C) produces specimen images on electron micrographs
D) uses dyes that emit visible light when bombarded by electrons
E) requires specimens to be stained

Answer: B
Section: 02.02
Topic: Microscopy
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

44) Which type of microscope does not use light in forming the specimen image?
A) Bright field
B) Dark field
C) Phase contrast
D) Fluorescence
E) Electron

Answer: E
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

45) Which type of microscope achieves the greatest resolution and highest magnification?
A) Bright field
B) Dark field
C) Phase contrast
D) Fluorescence
E) Electron

Answer: E
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
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46) Which type of microscope bombards a whole, metal-coated specimen with electrons moving back and forth over it?
A) Differential interference contrast
B) Scanning electron
C) Transmission electron
D) Phase contrast
E) Fluorescence

Answer: B
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.05 Use appropriate microbiological and molecular lab equipment and methods.

47) The specimen preparation that is best for viewing cell motility is _____.
A) hanging drop
B) fixed stained smear
C) Gram stain
D) negative stain
E) flagellar stain

Answer: A
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

48) The purpose of staining cells on a microscope slide is to _____.
A) kill them
B) secure them to the slide
C) enlarge the cells
D) add contrast in order to see them better
E) see motility

Answer: D
Section: 02.02
Topic: Microscopy; Preparing Microscopy Specimens
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

49) What do the Gram stain, acid-fast stain, and endospore stain have in common?
A) They are used on a wet mount of the specimen.
B) They use heat to force the dye into cell structures.
C) The outcome is based on cell differences.
D) They use a negative stain technique.
E) They are simple stains.

Answer: C
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

50) Basic dyes are _____.
A) attracted to the negatively charged acidic substances of bacterial cells
B) anionic
C) used in negative staining
D) repelled by cells
E) dyes such as India ink and nigrosin

Answer: A
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

51) A microbiologist makes a fixed smear of bacterial cells and stains them with Loeffler's methylene blue. All the cells appear blue under the oil lens. This is an example of _____.
A) negative staining
B) using an acidic dye
C) simple staining
D) using the acid-fast stain
E) capsule staining

Answer: C
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

52) The Gram staining procedure is best described as a(n) _____ staining technique.
A) acid-fast or Ziehl-Neelson
B) differential
C) capsule
D) flagellar
E) simple

Answer: B
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

53) The procedures for culturing a microorganism require the use of a microscope.

Answer: FALSE
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

54) Some microbes are not capable of growing on artificial media.

Answer: TRUE
Section: 02.01
Topic: Culturing Microorganisms; Microbial Growth and Nutrition
Bloom's: 01. Remember
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

55) A selective medium contains one or more substances that inhibit growth of certain microbes in order to facilitate the growth of other microbes.

Answer: TRUE
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, or biological means.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

56) One colony typically develops from the growth of several parent bacterial cells.

Answer: FALSE
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.04 Estimate the number of microorganisms in a sample (using, for example, direct count, viable plate count, and spectrophotometric methods).

57) Mixed cultures are also referred to as contaminated cultures.

Answer: FALSE
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

58) Bacterial cultures are easily identified from their microscopic appearance.

Answer: FALSE
Section: 02.01
Topic: Identifying Microorganisms
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

59) Normal incubation temperatures range from 30°C to 60°C.

Answer: FALSE
Section: 02.01
Topic: Culturing Microorganisms; Microbial Growth and Nutrition
Bloom's: 01. Remember
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 03.04 The growth of microorganisms can be controlled by physical, chemical, mechanical, or biological means.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

60) The bending of light rays as they pass from one medium to another is called refraction.

Answer: TRUE
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

61) The real image is the reverse of the actual specimen.

Answer: FALSE
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

62) A confocal microscope uses visible light as its source of illumination.

Answer: FALSE
Section: 02.02
Topic: Microscopy
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.05 Use appropriate microbiological and molecular lab equipment and methods.

63) Fixed smears of specimens are required in order to perform the Gram stain and endospore stain on the specimens.

Answer: TRUE
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

64) At the end of the Gram stain, gram-positive bacteria will be seen as red/pink cells.

Answer: FALSE
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 01. Remember
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

65) The all-purpose media Tryptic Soy Agar (TSA) contains the following four ingredients; pancreatic digest of casein, digest of soybean meal, NaCl and agar. TSA is best described as _____.
A) a differential media
B) a complex media
C) a selective media
D) a defined media
E) a reducing media

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

66) Comparing defined vs. complex media is analogous to comparing _____.
A) baby formula to breast milk
B) Coca-cola® to Pepsi®
C) the generic version of the drug Lipitor® to the brand name produced by Pfizer Pharmaceuticals
D) a strawberry-banana smoothie to a mixed berry smoothie

Answer: A
Section: 02.01
Topic: Microbial Growth and Nutrition
Bloom's: 05. Evaluate
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).

67) The diameter of field for a 4x lens is measured at 4.6 mm. How many bacterial cells, each measuring 4 μm, could be lined up along the diameter?
A) 1,150 cells
B) 1.15 cells
C) 18.4 cells
D) 115 cells
E) 1840 cells

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 04. Analyze
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

68) The relationship between a micrometer and a millimeter is _____.
A) a millimeter is 10 times larger than a micrometer
B) a micrometer is 1,000 times smaller than a millimeter
C) a millimeter is 100 times smaller than a micrometer
D) a micrometer is 1,000 times larger than a millimeter
E) a millimeter is 10 times smaller than a micrometer

Answer: B
Section: 02.02
Topic: Microscopy
Bloom's: 03. Apply
ASM Topic: Module 07 Scientific Thinking
ASM Objective: 07.02 Ability to use quantitative reasoning: Use mathematical reasoning and graphing skills to solve problems in microbiology.

69) In the absence of immersion oil when using the 100x objective lens, some light would be lost to scatter resulting in a blurry image.

Answer: TRUE
Section: 02.02
Topic: Microscopy
Bloom's: 02. Understand
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

70) Resolution differs from contrast in microscopy in that _____.
A) resolution refers to the ability to distinguish two cells from one another, whereas contrast refers to the ability to distinguish a cell from its surroundings
B) contrast refers to the ability to distinguish two cells from one another, whereas resolution refers to the ability to distinguish a cell from its surroundings
C) resolution is measured by the refractive index of light whereas contrast depends on the use of oil
D) contrast is improved by adding oil to the specimen with the 100x objective lens and resolution is improved by adjusting the iris diaphragm control lever

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

NCLEX Prep - Test Bank Question: Please read the clinical scenario, and then answer the questions that follow to become familiar with the traditional NCLEX question format.

An RN is working at an urban low-income medical clinic when a young woman enters crying. She is 19 years old and 28 weeks pregnant with her second child. The woman reports that she woke this morning to find she was leaking milky-colored fluid vaginally. Her first child was born 6 weeks early due to premature rupture of membranes and she is worried this is happening again. You reassure the patient, explain that a vaginal speculum exam will be performed, and educate her about specimens that will be collected. Once the proper specimens are obtained and appropriately labeled, the wet mount and culturette are sent to the laboratory for processing.

71) The RN understands that along with a pH test, a microscopic view is needed to perform the ferning test to detect an amniotic fluid leak. The patient sample is prepared on a glass slide and examined under 10x magnification. Which type of microscope will be used to make this observation of the patient sample?
A) Electron microscope
B) Light microscope
C) Confocal microscope
D) Fluorescent microscope

Answer: B
Section: 02.01; 02.02
Topic: Microscopy; Identifying Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

72) When utilizing a light microscope, the specimen on the glass slide must be in proper position to ensure illumination of the specimen for visualization. The glass slide is placed in which of the following positions?
A) Between the condenser lens and the objective lens
B) Directly on top of the light source
C) Between the ocular lens and the objective lens
D) Between the light source and the condenser lens

Answer: A
Section: 02.02
Topic: Microscopy
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

73) The sterile vaginal fluid specimen is sent for culture. The RN educates the patient about the five basic techniques utilized by laboratory technicians to manipulate, grow, examine, and characterize any microorganisms present in the specimen. Which of the following is the correct order of steps for processing the specimen?
A) Isolation, incubation, inspection, identification, and inoculation
B) Inspection, identification, isolation, incubation, and inoculation
C) Identification, isolation, incubation, inspection, and inoculation
D) Inoculation, incubation, isolation, inspection, and identification

Answer: D
Section: 02.01
Topic: Microscopy; Identifying Microorganisms; Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).; 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

74) The patient asks how microbes from her body can be grown in the lab. The RN explains that specimens are introduced to nutrient medium and that any growth of the microbe that appears after incubating the specimen is called the _____.
A) colony
B) culture
C) microorganism
D) infectious agent

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 03.03 The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

75) The patient is diagnosed with a bacterial infection after gram-positive cocci are detected in the fluid sample. The Gram stain involves _____.
A) forcing a dye into resistant bodies with heat to distinguish between spores and cells
B) timed, sequential applications of crystal violet dye, iodine, an alcohol rinse, and a contrasting counterstain to the sample
C) application of the dye, carbol fuchsin, followed by an acid alcohol rinse
D) application of India ink to detect the presence of bacterial capsules

Answer: B
Section: 02.02
Topic: Preparing Microscopy Specimens
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

NCLEX Prep - Test Bank Question: Please read the clinical scenario, and then answer the questions that follow to become familiar with the traditional NCLEX question format.

An RN is working at a public health clinic that sees many patients with infectious disease. Ms. Hungh, a Burmese immigrant, presents to the clinic with an interpreter, complaining of fatigue, weight loss, persistent cough, and rust-colored sputum. The interpreter explains that Ms. Hungh has had this cough for many months in her home country and, now that she is in America, is seeking treatment for her condition.

76) A sputum sample is ordered for microbial analysis in order to rule out the diagnosis of tuberculosis. Suspecting *Mycobacterium tuberculosi*s may be the pathogen, the RN knows the laboratory technicians will perform which stain on the sample?
A) Endospore stain
B) Negative stain
C) Flagellar stain
D) Acid-fast stain

Answer: D
Section: 02.02
Topic: Identifying Microorganisms; Preparing Microscopy Specimens
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.01 Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

77) Ms. Hungh's acid-fast stain results resulted as inconclusive for the presence of acid-fast bacilli. Culturing of the sputum is performed in order to isolate microbial growth for further analysis. Lowenstein-Jensen medium is utilized to select for the growth of *Mycobacterium* species if present in the sample, while suppressing unwanted background organisms. What is the proper term for this type of medium?
A) Differential medium
B) Selective medium
C) Differential medium and selective medium
D) None of the choices are correct.

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

78) Culturing of the sputum resulted in the growth of distinct colonies and further isolation by subculturing is now needed. The RN understands that isolation is accomplished by taking a bit of growth from an individual colony and inoculating a separate medium, resulting in the production of a(n) _____.
A) simple culture
B) pure culture
C) isolated culture
D) mixed culture

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

NCLEX Prep - Test Bank Question: Please read the clinical scenario, and then answer the questions that follow to become familiar with the traditional NCLEX question format.

A 65-year-old homeless male presents to an urgent care clinic with a deep laceration on his left arm. He states that he cut his arm on an old piece of scrap metal two days prior. His wound is red, tender, hot to the touch, and has yellow drainage. The RN collects a sample of the drainage and sends it to the laboratory for microbial analysis, per provider orders.

79) The patient's culture results positive for *Staphylococcus*. The RN understands that the culture most likely required growth on a complex medium, consisting of
A) an exact chemical formula.
B) chemical growth inhibitors.
C) at least one ingredient that is not chemically defined.
D) None of the choices are correct.

Answer: C
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 08.02 Use pure culture and selective techniques to enrich for and isolate microorganisms.

80) Microscopic analysis revealed the presence of grapelike clusters of gram-positive cocci. The RN educates the patient that the species identification of the organism will require biochemical testing, which aids in microbial identification by providing information on cellular metabolism. Which of the following statements by the patient demonstrates understanding of the nurse's teaching?
A) Biochemical tests can determine the organism's nutrient requirements.
B) Biochemical tests can determine the presence of enzymes in the sample.
C) Biochemical tests can provide information about products given off during growth.
D) Biochemical tests can provide information about the microbe's mechanism for deriving energy.
E) All of these statements are correct.

Answer: C
Section: 02.01
Topic: Identifying Microorganisms; Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 03 Metabolic Pathways; Module 08 Microbiology Skills
ASM Objective: 08.03 Use appropriate methods to identify microorganisms (media-based, molecular and serological).; 03.01 Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g., nitrogen fixation, methane production, anoxygenic photosynthesis).

81) Cultures and specimens pose a potential health hazard and require proper handling and disposal via specific medical waste policies. Some facilities are regulated to maintain living catalogs of specimens that may be subcultured into a fresh medium for research and educational purposes. Such collections are referred to as _____.
A) live microbes
B) stock cultures
C) reserved specimens
D) bacteriological reserve

Answer: B
Section: 02.01
Topic: Culturing Microorganisms
Bloom's: 03. Apply
ASM Topic: Module 08 Microbiology Skills
ASM Objective: 08.06 Practice safe microbiology, using appropriate protective and emergency procedures.