Test Bank for Textbook of Diagnostic Microbiology 7th Mahon

Test Bank - Chapter 01

Q: To survive, microbial inhabitants have learned to adapt by varying all of the following, *except*

A. growth rate.
B. growth in all atmospheric conditions.
C. growth at particular temperatures.
D. bacterial shape. (Correct)

Q: Who was considered the father of protozoology and bacteriology?

A. Anton van Leeuwenhoek (Correct)
B. Louis Pasteur
C. Carl Landsteiner
D. Michael Douglas

Q: Prokaryotic cells have which of the following structures in their cytoplasm?

A. Golgi apparatus
B. Ribosomes (Correct)
C. Mitochondria
D. Endoplasmic reticulum

Q: This form of DNA is commonly found in eukaryotic cells.

A. Linear (Correct)
B. Circular
C. Plasmid
D. Colloid

Q: The nuclear membrane in prokaryotes is

A. missing. (Correct)
B. impenetrable.
C. a classic membrane.
D. a lipid bilayer membrane.

Q: A microorganism that is a unicellular organism and lacks a nuclear membrane and true nucleus belongs to which classification?

A. Fungi
B. Bacteria (Correct)
C. Algae
D. Parasite

Q: In the laboratory, the clinical microbiologist is responsible for all the following, *except*

A. isolating microorganisms.
B. selecting treatment for patients. (Correct)
C. identifying microorganisms.
D. analyzing bacteria that cause disease.

Q: What enables the microbiologist to select the correct media for primary culture and optimize the chance of isolating a pathogenic organism?

A. Determining staining characteristics
B. Understanding the cell structure and biochemical pathways of an organism
C. Understanding the growth requirements of potential pathogens at specific body site (Correct)
D. Knowing the differences in cell walls of particular bacteria

Q: A clinical laboratory scientist is working on the bench, reading plates, and notices that a culture has both a unicellular form and a filamentous form. What type of organism exhibits these forms?

A. Virus
B. Fungi (Correct)
C. Bacteria
D. Parasite

Q: All of the following statements are true about viruses, *except*:

A. Viruses consist of DNA or RNA but not both.
B. Viruses are acellular but are surrounded by a protein coat.
C. Viruses can infect bacteria, plants, and animals.
D. Viruses do not need host cells to survive and grow. (Correct)

Q: Diagnostic microbiologists apply placement and naming of bacterial organisms into all the following categories, *except*

A. order. (Correct)
B. family.
C. genus.
D. species.

Q: Bacterial species that exhibit phenotypic differences are considered

A. biovarieties.
B. serovarieties.
C. phagevarieties.
D. subspecies. (Correct)

Q: What structure is described as a phospholipid bilayer embedded with proteins and sterols that regulates the type and amount of chemicals that pass in and out of a cell?

A. Cell wall
B. Mitochondria
C. Endoplasmic reticulum
D. Plasma membrane (Correct)

Q: What makes the interior of the plasma membrane potentially impermeable to water-soluble molecules?

A. The hydrophobic tails of the phospholipid molecules are found there. (Correct)
B. The hydrophilic tails of the phospholipid molecules are found there.
C. The ion channels are found there.

D. The cholesterol molecules in the plasma membrane are found solely in the interior of the membrane.

Q: The function of a cell wall is to

A. regulate the transport of macromolecules in and out of the cell.
B. provide rigidity and strength to the exterior of the cell. (Correct)
C. provide reserve energy to the eukaryotic cell.
D. protect the eukaryote from predators.

Q: Name the numerous short (3 to 10 μm) projections that extend from the cell surface and are used for cellular locomotion.

A. Flagella
B. Mitochondria
C. Cilia (Correct)
D. Phospholipid

Q: A microbiology technologist performs a traditional bacterial stain on a colony from a wound culture that is suspected to contain bacteria from the genus *Clostridium.* The unstained areas in the bacterial cell observed by the technologist are called

A. cilia.
B. ribosomes.
C. endospores. (Correct)
D. mitochondria.

Q: This constituent of a gram-positive cell wall absorbs crystal violet but is not dissolved by alcohol, thus giving the gram-positive cell its characteristic purple color.

A. Mycolic acid
B. Cholesterol
C. Carbolfuchsin
D. Peptidoglycan (Correct)

Q: Mycobacteria have a gram-positive cell wall structure with a waxy layer containing these two compounds.

A. Glycolipids and mycolic acid (Correct)
B. Glycolipids and phospholipids
C. Mycolic acid and lipopolysaccharides
D. Lipopolysaccharides and phospholipids

Q: When performing a Gram stain on a gram-negative organism, the crystal violet is absorbed into this outer cell wall layer, and then washed away with the acetone alcohol. What is the main component of the outer layer of the cell wall?

A. Peptidoglycan
B. Mycolic acid
C. *N*-Acetyl-D-muramic acid
D. Lipopolysaccharide (Correct)

Q: The three regions of the lipopolysaccharide include all the following, *except*

A. antigenic O-specific polysaccharide.
B. mycolic acid. (Correct)
C. core polysaccharide.
D. endotoxin (inner lipid A).

Q: The outer cell wall of the gram-negative bacteria serves three important functions, which includes all the following, *except*:

A. It provides an attachment site for the flagella, which will act in locomotion. (Correct)
B. It acts as a barrier to hydrophobic compounds and harmful substances.
C. It acts as a sieve.
D. It provides attachment sites that enhance adhesion to host cells.

Q: *Mycoplasma* and *Ureaplasma* spp. must have media supplemented with serum or sugar as nutrients and because

A. their cell walls contain only peptidoglycan.
B. they lack cell walls. (Correct)
C. the sterols in their cell walls are soluble in normal bacterial media.
D. their cell walls contain detoxifying enzymes.

Q: What is the purpose of a capsule?

A. Prevent osmotic rupture of the cell membrane
B. Make up the periplasmic space
C. Act as a virulence factor in helping the pathogen evade phagocytosis (Correct)
D. Provide an attachment site for somatic antigens

Q: The three basic shapes of bacteria include all the following, *except*

A. spirochetes.
B. cell wall deficient. (Correct)
C. cocci.
D. bacilli.

Q: The Gram stain is a routine stain used in bacteriology to determine gram-positive and gram-negative bacteria based on the

A. phenotypic characteristics of the organism.
B. composition of the bacterial cell wall. (Correct)
C. composition of the bacterial cell membrane.
D. composition of the bacterial pili.

Q: In what staining procedure does carbolfuchsin penetrate the bacterial cell wall through heat or detergent treatment?

A. Gram stain
B. Acridine orange stain
C. Endospore stain
D. Acid-fast stain (Correct)

Q: What stain is used for medically important fungi?

A. Methylene blue
B. Acridine orange
C. Acid-fast
D. Lactophenol cotton blue (Correct)

Q: All the following are types of media, *except*

A. selective.
B. differential.
C. fastidious. (Correct)
D. transport.

Q: Which of the following environmental factors influence the growth of bacteria in the laboratory?

A. pH
B. Temperature
C. Gaseous composition of the atmosphere
D. All of the above (Correct)

Q: Some bacteria grow at 25°C or 42°C, but diagnostic laboratories routinely grow pathogenic bacteria at what temperature?

A. 30°C
B. 60°C
C. 35°C (Correct)
D. 10°C

Q: Which of these bacteria cannot grow in the presence of oxygen?

A. Obligate aerobes
B. Capnophilic organisms
C. Facultative anaerobes
D. Obligate anaerobe (Correct)

Q: What class of organisms, such as the *Streptococcus* sp., can survive in the presence of oxygen but do not use oxygen in its metabolic processes?

A. Microaerophilic
B. Aerotolerant anaerobe (Correct)
C. Obligate anaerobe
D. Facultative anaerobe

Q: The laboratory receives a specimen in which the doctor suspects that the infecting organism is *Haemophilus influenzae.* This organism grows best in an atmosphere that contains 5% to 10% carbon dioxide. It is therefore classified as what type of bacteria?

A. Obligate aerobe
B. Capnophilic (Correct)
C. Facultative anaerobe
D. Obligate anaerobe

Q: The following describes the log phase of bacterial growth:

A. Preparing to divide
B. Limited nutrients with bacteria count remaining constant
C. Number of nonviable bacterial cells exceeds the number of viable cells
D. Bacteria doubling with each generation time (Correct)

Q: Diagnostic schemes in the microbiology laboratory typically analyze each unknown bacterium's metabolic processes for all the following, *except*

A. utilization of a variety of substrates as carbon sources.
B. energy utilization for metabolic processes. (Correct)
C. production of specific end products from specific substrates.
D. production of an acid or alkaline pH in the test medium.

Q: Which is a biochemical process carried out by both obligate and facultative anaerobes?

A. Fermentation (Correct)
B. Respiration
C. Oxidation
D. Reduction

Q: What type of fermentation produces lactic, acetic, succinic, and formic acids as the end products?

A. Butanediol
B. Propionic
C. Mixed acid (Correct)
D. Homolactic

Q: If bacteria utilize various carbohydrates for growth, they are usually detected by

A. alkaline production and change of color from the pH indicator.
B. production of carbon dioxide.
C. production of keto acids.
D. acid production and change of color from the pH indicator. (Correct)

Q: In the medical microbiology laboratory, the ability of a gram-negative bacterium to ferment this sugar is the first step in its identification.

A. Sucrose
B. Mannitol
C. Trehalose
D. Lactose (Correct)

Q: A _____ is a single, closed, circular piece of DNA that is supercoiled to fit inside a bacterial cell.

A. phenotype
B. chromosome (Correct)
C. frame-shift mutation
D. transposon

Q: Genes that code for antibiotic resistance are often found on small, circular pieces of DNA. These DNA pieces are called

A. plasmids. (Correct)
B. phenotypes.
C. chromosomes.
D. genomes.

Q: What process involves transferring or exchanging genes between similar regions on two separate DNA molecules?

A. IS element
B. Replication
C. Recombination (Correct)
D. Transcription

Q: A microbiologist is working with two separate cultures of the same organism. The bacteria in one culture are resistant to penicillin, whereas the bacteria in the other culture are susceptible to penicillin. The bacteria from both cultures are mixed together, and all the resulting bacteria are resistant to penicillin. What caused this phenomenon?

A. The plasmid carrying the resistance gene was transferred to the susceptible population of bacteria. (Correct)
B. The plasmid carrying the susceptibility gene was transferred to the resistant population of bacteria.
C. An IS element was inserted into the genome of the susceptible bacterial population.
D. A frame-shift mutation occurred that allowed the susceptible population of bacteria to develop resistance to penicillin.

Q: Diphtheria is a disease produced by *Corynebacterium diphtheriae*. However, not all *C. diphtheriae* bacteria produce the toxin that causes this disease. To produce the toxin, the bacteria must first become infected with a bacteriophage. The process by which bacterial genes are transferred to new bacteria by the bacteriophage is called

A. conjugation.
B. transduction. (Correct)
C. replication.
D. transformation.

Q: Lysogeny occurs when

A. genes present in the IS element are expressed in the bacterial cell.
B. genetic material is transferred from one bacterium to another through a sex pilus.
C. competent bacteria cells take up naked DNA.
D. genes present in the bacteriophage DNA are incorporated into the bacteria's genome. (Correct)

Q: These are enzymes that cut the bacterial DNA at specific locations.

A. Bacteriophage enzymes
B. Restriction enzymes (Correct)
C. Temperate lysogeny enzymes
D. Conjugation enzymes

Review Questions - Chapter 01

Q: Dimorphic fungi characteristically grow in this phase at 37°C.

A. Filamentous
B. Yeast (Correct)
C. Syncytial
D. Mycelial

Q: A virus that infects and possibly destroys bacterial cells is called a(n)

A. virion.
B. biovar.
C. bacteriophage. (Correct)
D. archaebacteria.

Q: A unique gram-positive bacteria cell wall component that is anchored to the peptidoglycan layer is called

A. teichoic acid. (Correct)
B. lipoteichoic acid.
C. *N*-acetyl-d-glucosamine.
D. endotoxin.

Q: This portion of the lipopolysaccharide layer is responsible for producing fever and shock conditions in patients infected with gram-negative bacteria.

A. Periplasmic space
B. O-specific polysaccharide
C. *N*-Acetyl-d-muramic acid
D. Lipid A (Correct)

Q: Which cytoplasmic structure is the site for rRNA synthesis?

A. Histone
B. Rough endoplasmic reticulum
C. Golgi apparatus
D. Nucleolus (Correct)

Q: Which of the following describes a fusiform shape?

A. Tapered, with pointed ends (Correct)
B. Curved
C. Swollen, with rounded ends
D. Helical

Q: Fifty percent of the dry weight of bacteria are composed of this essential element for bacterial growth.

A. Nitrogen
B. Carbon (Correct)
C. ATP

D. Potassium

Q: Media containing additives that inhibit the growth of some bacteria but allow other to grow are called

A. nutrient.
B. selective. (Correct)
C. differential.
D. transport.

Q: Cells that take up naked DNA are referred to as

A. competent. (Correct)
B. clones.
C. homologous.
D. transduced.

Q: The transfer of genetic material from a donor bacterial strain to a recipient strain is called

A. lysogeny.
B. transformation.
C. transduction.
D. conjugation. (Correct)