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The Authors

Component

Function

This is the topmost part of the microscope; the lens through which the

Ocular lens or eyepiece Component	viewer looks to see the specimen. Function
Revolving nose piece	Located above the stage, it holds the objective lenses.
Diopter adjustment	It is used to change focus on one eyepiece in order to correct any difference in vision between the two eyes.
Body tube or head	It connects the eyepiece to the objective lenses.
Arm	It connects the body tube to the base of the microscope.
Coarse adjustment	It brings the specimen into general focus.
Fine adjustment	It fine-tunes the focus and increases the details of the specimen.
Objective lenses	This is held in place above the stage by the revolving nosepiece and are the lenses that are closest to the specimen. It contains three to five objectives ranging in power from 4X to 100X.
Stage	Located beneath the revolving nosepiece, it is the flat platform on which the specimen is placed.
Stage clips	Situated above the stage, these are metal clips that hold the slide in place.
Stage control	Found beneath the stage, these knobs move the stage either left or right or forward and backward.
Aperture	This is the hole in the middle of the stage that allows light from the illuminator to reach the slide containing the specimen.
On/off switch	This is the switch located at the base of the microscope that turns the illuminator on or off.
Illuminator	This is the light source of the microscope.
Iris diaphragm	Found on the condenser, it is used to adjust the amount of light coming through the condenser.
Condenser	It is found beneath the stage and contains a lens system that focuses light onto the specimen. It gathers and focuses light onto the specimen.
Base	It supports the microscope and it is where the illuminator is found.

Table 1.2 Reagents used in Gram-staining and expected results

Reagent	Function	Result if gram positive	Result if gram negative
Crystal violet	Primary stain	Purple or blue	Purple or blue
Gram's iodine	Mordant*	Purple or blue	Purple or blue
Acetone or 95% alcohol	Decolorizer	Purple or blue	Colorless
Safranin	Counterstain or secondary stain	Purple or blue	Red or pink

Table 1.3 Reagents used in acid-fast staining and the expected results

Reagent	Result

Ziehl-Neelsen Reagent	Kinyoun	Function	Acid-fast Result	Non-acid-fast
Carbol fuchsin	Carbol fuchsin	Primary stain	Red or pink	Red or pink
Acid alcohol	Acid alcohol	Decolorizer	Red	Colorless
Methylene blue	Malachite green	Counterstain or secondary stain	Ziehl-Neelsen: red organism/ blue background Kinyoun: red organism/ green background	Ziehl-Neelsen: blue organism/blue background Kinyoun: green organism/ green background

Name:		Score:
Section:		Date:
		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.
1.		Which among the following groups of organisms are not considered cells?
	a. Bacteria	c. Viruses
	b. Fungi	d. Algae
2.		Which among the following types of microscopes can be used to study the genetic material of a cell (DNA or RNA) by adding a special form of dye?
	a. Phase-contrast microscope	c. Fluorescence microscope
	b. Scanning probe microscope	d. Confocal microscope
3.	slide in place?	Which among the following parts of the microscope can be used to hold the
	a. Coarse adjustment	c. Eye piece
	b. Fine adjustment	d. Stage clip
4.		Who among the following scientists discovered the vaccine for smallpox?
	a. Louis Pasteur	c. Edward Jenner
	b. Alexander Fleming	d. Robert Koch
5.	use?	You discovered a new organism and you want to study its three dimensional image and cell physiology. Which type of microscope will you
	a. Electron microscope	c. Scanning probe microscope
	b. Fluorescence microscope	d. Confocal microscope
6.	microscope will you use to move the stage left or right?	You are given a new slide to study in the laboratory. Which part of the
	a.	c.

Name:	Stage control	Objective lenses Score:
	b. Coarse adjustment	d. Fine adjustment

7.	differential media?	Which among the following classes of culture media is classified as
	a. Thayer-Martin agar	c. Sabouraud dextrose agar
	b. Löwenstein-Jensen agar	d. MacConkey agar
8.	counterstain?	Which among the following reagents used in Gram staining is used as a
	a. Crystal violet	c. 95% alcohol
	b. Gram's iodine	d. Safranin
9.	type of hemolytic reaction?	You cultured an organism using blood agar, and after 24 hours you noted a greenish zone of hemolysis around the colonies. This is classified as what
	a. Alpha hemolysis	c. Delta hemolysis
	b. Beta hemolysis	d. Gamma hemolysis
10.	Kinyoun method of acid-fast staining?	Which among the following reagents is used as the counterstain in the
	a. Safranin	c. Malachite green
	b. Carbol fuchsin	d. Methylene blue

Feature	Prokaryotic Cell	Eukaryotic Cell
Genetic material	Not enclosed within a membrane; not associated with histones; usually circular	Enclosed within a membrane; associated with histones; usually linear
Size	Smaller (1–2 µm by 1–4 µm or less)	Larger (greater than 5 µm)
Cell type	Mostly unicellular	Mostly multicellular
Nucleus	No true nucleus and nuclear membrane; called nucleoid	With true nucleus enclosed by nuclear membrane
Cell wall Simple		Complex
Cell division Budding or binary fission		Mitosis
Sexual reproduction	No meiosis; transfer of DNA only	Meiosis
Cytoskeleton	Absent	Present
Mesosome	Functions as mitochondria and Golgi complex	Absent

Feature	Prokaryotic Cell	Eukaryotic Cell
Ribosomes	70S; located in	80S; located in membranes such as

A. Name: Section:		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.	Score:	Date:
1.		The outer surface of viruses is called which of the following?		
	a.	Capsomere	c.	Capsid
	b.	Cell wall	d.	Chitin
2.		Which of the following is not a basis for classifying viruses?		
	a.	Type of nucleic acid they possess		
	b.	Susceptibility to antimicrobials		
	c.	Type of host infected		
	d.	Type of disease caused		
3.		What do you call the main component of the cell wall of fungi?		
	a.	Chitin	c.	Ergosterol
	b.	Peptidoglycan	d.	Pellicle
4.		Which of the following serves as source of energy for both algae and plants?		
	a.	Oxygen	c.	Nitrogen
	b.	Carbon dioxide	d.	Phosphorus
5.		Sterols are found in the cell membrane mainly of which class of organism?		
	a.	Bacteria	c.	Fungi
	b.	Algae	d.	Protozoa

Write a if the item is associated with prokaryotes only;

b if the item is associated with eukaryotes only;

c if the item is associated with both prokaryotes and eukaryotes;
or

d if the item is not associated with prokaryotic nor eukaryotic cells.

1.
Reproduce by binary fission

2.
With 70S ribosomes

3.
Do not have membrane-bound organelles

4.
DNA associated with histones

5.
Can cause significant disease in humans

Name:

Score:

Section:

Date:

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

Name:		Score:	
1.	Rod-shaped bacteria are known as:		
	a. Cocci	c.	Spirochetes
	b. Bacilli	d.	Coccobacilli
2.	material of the bacteria?		Which among the following bacterial structures contains the genetic
	a. Capsule	c.	Cell membrane
	b. Nucleoid	d.	Outer membrane
3.	negative bacteria?		Which among the following cell wall components is found only in gram
	a. Lipopolysaccharide	c.	Mycolic acid
	b. Teichoic acid	d.	Muramic acid
4.	gram-positive bacteria?		Which among the following statements is correct regarding the cell wall of
	a. It cannot be stained with crystal violet.		
	b.		Its outer layer is hydrophobic due to the presence of lipids.
	c. Its outer layer consists of a multilayered peptidoglycan.		
	d. The major component is lipoteichoic acid.		
5.	following?		A bacterium that has flagella all over its body is classified as which of the
	a. Lophotrichous	c.	Peritrichous
	b. Monotrichous	d.	Amphitrichous
6.	Which of the following structures is utilized by bacteria for cell division?		
	a. Pilus	c.	Mesosome
	b. Flagella	d.	Axial filament
7.	bacteria?		Which among the following is the site of the electron transport chain in
	a. Cell membrane	c.	Outer membrane
	b. Cell wall	d.	Capsule
8.	fast organisms is hydrophobic?		Which of the following components is the reason why the cell wall of acid
	a. Teichoic acid	c.	Mycolic acid
	b. Muramic acid	d.	Dipicolinic acid
9.	adverse environmental conditions?		Which among the following is produced by some bacteria when placed in
	a. Much granules	d.	a, b, and c
	b. Metachromatic granules	e.	a and b only
	c. Endospores		
			Which of the following is a structure found in gram-negative organisms

10. 6. only and that contains the substance responsible for its endotoxin activity? Which of the following structures is utilized by bacteria for cell division?

- | | | | |
|----|---------------|----|-------------------|
| a. | Cell wall | c. | Outer membrane |
| b. | Cell membrane | d. | Periplasmic space |

Name:

Score:

Section:

Date:

A. MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

1. source are called: Microorganisms that utilize inorganic compounds as sole carbon

a. Phototrophs c. Chemotrophs

b. Heterotrophs d. Autotrophs

2. electron transport chain? Which among the following is a component of cytochrome in the

a. Iron c. Calcium

b. Nitrogen d. Potassium

3. they do not possess which of the following enzymes? Obligate anaerobes cannot survive in the presence of oxygen because

a. Catalase d. a and b only

b. Coagulase e. a and c only

c. Superoxide dismutase

4. optimal growth? What do you call bacteria that require increased salt concentration for

a. Photoorganotrophs c. Mesophiles

b. Alkalophiles d. Halophiles

5. Bacteria that require an optimum temperature of 10–20°C are called:

a. Thermophiles c. Psychrophiles

b. Mesophiles d. Neutrophiles

6. positive bacterial cell wall? Which of the following inorganic ions is a component of gram

a. Calcium c. Nitrogen

b. Iron d. Phosphorus

Write a if the item is associated with i only;

b if the item is associated with ii only;

c if the item is associated with both i and ii; or

d if the item is not associated with i or ii.

1. Formation of spores occurs

Write a if the item is associated with i only;		Stationary phase	ii.	Death or decline phase
2.		Characterized by increased metabolic activity of the organism		
	i.	Lag phase	ii.	Log phase
3.		Period when the generation time is determined		
	i.	Lag phase	ii.	Log phase
4.		The number of dead cells = the number of living cells.		
	i.	Stationary phase	ii.	Death or decline phase

Organism	Remarks
Staphylococcus epidermidis	This is a major skin inhabitant, comprising approximately 90% of resident aerobic flora.
Staphylococcus aureus	This is most commonly found in nose and perineum; in the nose, number varies with age (greater in newborns than in adults).
Micrococci (Micrococcus luteus)	This accounts for 20–80% of micrococci in the skin.
Diphtheroids (Coryneforms)	These are classified into: lipophilic (common in axilla)
	or non-lipophilic (more common on glabrous or hairless skin such as palms of hands).
	Anaerobic diphtheroids (Propionibacterium acnes) are most common in areas rich in sebaceous glands.
Gram-negative Bacilli (Enterobacter, Klebsiella, Escherichia coli, and Proteus spp.)	These are seen in moist intertriginous areas such as toe webs and axilla.
Nail Flora	Microflora are similar to that of the skin.
	Fungi may also be present (Aspergillus, Penicillium, Cladosporium, or Mucor).

Name:		Score:	
Section:		Date:	
	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.		
1.	Which of the following is true of resident flora?		
	a.	Temporarily inhabits specific body areas for a few hours or days	
	b.	Derived mainly during intrauterine life	
	c.	Regularly found in a given area at a given age and of a fixed type	
	d.	Produces significant disease in healthy individuals	
2.	Which of the following is a predominant inhabitant of the skin?		

Name:	a. Staphylococcus aureus	c. Streptococci
	b. Staphylococcus epidermidis	d. Micrococcus luteus
3.	except:	There is temporary carriage of the following organisms in the pharynx,
	a. Haemophilus influenzae	c. Streptococcus pneumoniae
	b. Neisseria meningitidis	d. Staphylococcus aureus
4.	Which of the following is true of vaginal flora?	
	a. It remains the same throughout the lifetime of the woman.	
	b. environment.	Before puberty, Escherichia coli may inhabit the vagina due the acidic
	c. the vaginal pH alkaline.	At puberty, the predominant flora include Lactobacillus which makes
	d.	Young girls are predisposed to gonococcal infection because their
5.	host?	What type of relationship exists between the normal flora and the human
	a. Mutualism	c. Parasitism
	b. Antagonism	d. Synergism
6.	from the small intestines?	Which of the following groups of bacteria are transient bacteria cultured
	a. Bacteroides, streptococci, and Lactobacillus	
	b. diphtheriae	Haemophilus influenzae, Streptococcus pneumoniae, and Corynebacterium
	c. Staphylococcus epidermidis, diphtheroids, and Candida	
	d.	Neisseria meningitidis, Corynebacterium diphtheriae, and Bordetella pertussis
7.	organism?	An outbreak of sepsis caused by Staphylococcus aureus has occurred in the newborn nursery. You are called upon to investigate. According to your knowledge of the normal flora, what is the most likely source of the
	a. Nose	c. Vagina
	b. Colon	d. Throat
8.	The following are sources of normal flora of the newborn, except:	
	a. Mother's genital tract during delivery	
	b. Normal flora in the mother's womb	
	c. Respiratory tract of those who handled the baby	
	d. The environment	
9.	The following are normally sterile at birth, except:	

5.	a. Cerebrospinal fluid b. Urinary bladder	c. Synovial fluid d. Esophagus	What type of relationship exists between the normal flora and the human
10.	Most microorganisms are found in which layer of the skin?		
	a. Stratum germinativum	c. Stratum corneum	
	b. Stratum lucidum	d. Stratum granulosum	
Name:		Score:	
Section:		Date:	
		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.	
1.	susceptible host?		Which of the following terms refers to how individuals acquire an infectious agent starting from the source until it enters the body of the
	a. Chain of infection	c. Mode of transmission	
	b. Portal of entry	d. Pathogenicity	
2.			Which of the following illustrates microorganism transmission via fomites?
	a.		Infected wound drainage comes in contact with the nurse's hands.
	b. A virus is transmitted through sexual intercourse.		
	c. someone coughs nearby.		Microorganisms comes in contact with a person's nasal mucus when
	d. Contaminated stethoscope touches a client's skin.		
3.	Which among the following is associated with surgical asepsis?		
	a. It is the absence of disease-causing microorganisms.		
	b.		It is an infectious control process aimed at reducing spread of infection.
	c. medications.		It is used for processes such as wound care or administration of IV
	d. Proper hand hygiene is an example.		
4.	called which of the following?		Infections that are acquired during the course of stay in the hospital are
	a. Nosocomial infection	c. Accidental infection	
	b. Sepsis	d. Localized infection	
5.	following reasons, except:		Handwashing is an essential part of infection control. It is done for the
	a. To reduce the flora on the health worker's skin		
	b.		To protect the healthcare worker in case there is a break in the skin

Name:	c. To reduce the chances of disease transmission	Score:
	d. To prevent drying of the skin after handling disinfectants	
6.	Which of the following organisms is not commonly involved in development of nosocomial infections?	
	a. Staphylococcus epidermidis c. Candida albicans	
	b. Pseudomonas aeruginosa d. Escherichia coli	
7.	Based on WHO recommendations, the gloves can be removed in all the following instances, except:	
	a. When handwashing is indicated	
	b. Before contact with a contaminated body site	
	c. After contact with a single patient and his/her surroundings	
	d. After contact with blood or body fluids	
8.	Which part of the gown is considered sterile?	
	a. From 5 inches below the elbow	
	b. From chest down to level of sterile field	
	c. Back of the gown	
	d. Neck and underarms	
9.	Which of the following is an example of reverse isolation?	
	a. A patient with a contagious infection is placed in a room with positive air pressure.	
	b. Patient must wear a mask every time someone enters the room.	
	c. All individuals entering the room must wear a mask.	
	d. All individuals entering the room as well as the patient must wear a mask.	

10. COVID-19 has been shown to spread via airborne route of transmission. Which of the following precautions must be observed to prevent spread of the infection in the community?
6. a. Wear protective mask at all times, even at home.
 is not commonly involved in development of nosocomial infections?
 Patients with symptoms must be placed in quarantine.

Name:

Score:

Section:

Date:

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

1. Which of the following is the process by which most microbial forms on inanimate objects are killed without necessarily destroying the spores?
- a. Sterilization
 b. Disinfection
 c. Tyndallization
 d. Lyophilization
2. Which of the following statements is true regarding the physical methods of sterilization?
- a. Dry heat is more effective than moist heat.
 b. Lower temperatures for heating.
 c. The presence of organic material such as fats may require lower temperatures for heating.
 d. Spore-forming microorganisms are more difficult to destroy.
 As the temperature increases, the time taken to sterilize also increases.
3. Which of the following methods is used mainly for sterilization of milk and milk products?
- a. Autoclaving
 b. Boiling
 c. Pasteurization
 d. Tyndallization
4. Which of the following conditions has been shown effective in destroying spore-forming organisms?
- a. Heating at 60–65 °C followed by rapid cooling
 b. Heating at 72 °C for 15 seconds followed by quick cooling to 13 °C
 c. Heating is done at 140 °C for a period of 15 seconds and 149 °C for 0.5 seconds
 d. Heating at 121 °C for 15–20 minutes at 15 psi

5. Which of the following methods causes destruction of organisms through production of reactive oxygen species?

- a. Ultraviolet light (UVL)
 b. Ionizing radiation
 c. Tyndallization
 d. Lyophilization

Which of the following is correct regarding

6.		Which of the following methods causes destruction of organisms through production of reactive oxygen species? <small>It is used in gaseous sterilization</small>	glutaraldehyde?
5.	a.		
	b.	It is less potent than formaldehyde.	
	c.	It is sporicidal.	
	d.	All of the above	
7.		kill all forms of the organism including the spores?	Which of the following is considered as the best antiseptic because it can
	a.	Phenol	c. Cresols
	b.	Alcohol	d. Iodine
8.			Which among the following is the mechanism of action of alcohol?
	a.	Denaturation of cellular proteins	
	b.		Modification of functional groups of proteins and nucleic acids
	c.	Damages the cell membrane	
	d.	Inhibits RNA synthesis	
9.		disinfectant or antiseptic?	Which among the following is not a characteristic of a good chemical
	a.	It should be stable and active in any pH.	
	b.		It should not leave a residual antimicrobial film on the treated surface.
	c.	It should non-toxic, hypoallergenic, and non-irritating.	
	d.	It should be safe under storage.	
10.		ophthalmia neonatorum?	Which of the following chemical agents is used clinically as treatment for
	a.	Mercurials	c. Iodine
	b.	Silver nitrate (1%)	d. Chlorhexidine

Target site modified	Antibiotics involved
Peptide subunits of peptidoglycan	Glycopeptides
Ribosome subunits	Macrolides, tetracyclines, aminoglycosides
Metabolic enzymes	Sulfa drugs, sulfones, trimethoprim
Lipopolysaccharide structure	Polymyxins

DNA gyrase Target site modified	Fluoroquinolones Antibiotics involved
RNA polymerase	Rifampin

Name:		Score:
	Section:	Date:
A.		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.
1.		Which of the following is the mechanism of action of tetracycline?
	a. subunit	Inhibits protein synthesis by binding to bacterial 30S ribosomal
	b. Inhibits microbial metabolic pathways	
	c.	Interferes with synthesis of bacterial cell wall
	d.	Alters the permeability of the cell membrane
2.	bacterium Bacillus sp.?	Which of the following antimicrobials was derived from the
	a. Penicillin	c. Bacitracin
	b. Tetracycline	d. Chloramphenicol
3.	infects bacteria?	Which among the following methods of gene exchange involves the transfer of genetic material by means of a bacteriophage, a virus that
	a. Transformation	c. Conjugation
	b. Transduction	d. Binary fission
4.	transpeptidase?	Which of the following acts by inhibiting the conversion of immature peptidoglycan to mature peptidoglycan by inhibiting the enzyme
	a. Cephalosporin	c. Chloramphenicol
	b. Tetracycline	d. Vancomycin
5.	fluoroquinolones?	Which among the following is the mechanism of resistance of
	a. Drug modification or inactivation	
	b. Bypass target enzyme	
	c. Modification of target sites	
	d. Target mimicry	

Column A	Column B
1.	a.
Tetracycline	Inhibition of cell wall

Column A	synthesis Column B
2.	b.
Cephalosporin	Alteration of cell membrane
	c. Inhibition of protein synthesis
3.	d.
Trimethoprim	Inhibition of DNA synthesis
4.	e.
Quinolones	Inhibition of RNA synthesis
5.	f.
Nystatin	Inhibition of microbial metabolic pathways

Factors that limit entry of microorganisms	Mode of action
Keratin layer of intact skin	Acts as a mechanical barrier
Lysozyme in tears and other secretions	Degrades bacterial cell wall
Respiratory cilia	Direct organisms trapped in mucus out of the respiratory passages
Low pH of stomach and vagina; fatty acids in skin	Inhibits growth of microorganisms
Surface phagocytes	Ingest and destroy microbes
Normal flora	Prevent colonization by pathogens
Factors that limit growth of the microorganisms within the body	Mode of action
Natural killer cells	Kill virus-infected cells
Neutrophils	Ingest and destroy microbes
Macrophages and dendritic cells	Ingest and destroy microbes; present antigens to T cells
Interferons	Inhibit viral replication; produce anti-viral state
Complement system	Membrane attack complex creates holes in bacterial cell membrane; components activate inflammation
Fever	Inhibits bacterial growth
Inflammatory response	Limits spread of microbes by destroying them

Property	Innate Immunity	Adaptive Immunity
Activity at birth	Yes	No
Response time	Immediate	Delayed
Specificity for microorganisms	Relatively low (PAMPs)	High (specific antigens)
	Phagocytic cells, NK cells,	B lymphocytes and T

Cells Property	and epithelial cells Innate Immunity	lymphocytes Adaptive Immunity
Memory	No	Yes
Response amplifiable	No	Yes
Components		
Physical and chemical barriers	Skin, mucosa; antimicrobial substances (e.g., defensins)	Secreted antibodies
Blood proteins	Complement	Antibodies
Line of defense	First and second	Third (immune response)

Secretory component					
	IgM	IgG	IgA	IgE	IgD
Heavy Chain	μ (mu)	γ (gamma)	α (alpha)	ε (epsilon)	δ (delta)
MW (Da)	900k	150k	385k	200k	180k
% of total antibody in serum	6%	80%	13%	0.002%	1%
Fixes complement	Yes	Yes	No	No	No
Function	Primary response, fixes complement. Monomer serves as B cell receptor	Main blood antibody, neutralizes toxins, opsonization	Secreted into mucus, tears, saliva	Antibody of allergy and anti-parasitic activity	B cell Receptor

Name:		Score:	
Section:			Date:
	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.		
1.	Which of the following is a central or primary lymphoid organ?		
	a. Appendix	c. Lymph node	
	b. Bone marrow	d. Spleen	
2.	response?	A patient is infected with SARS-CoV-2. In response, there is activation of CD8+ T lymphocytes. This is an example of which type of immune	
	a. Adaptive, cell-mediated	c. Innate, cell-mediated	
	b. Adaptive, humoral	d. Innate, humoral	
3.	Which of the following is a characteristic of innate immunity?		
	a. Specific	c. Possesses immunologic memory	
	b. Short-term protection	d. Amplifiable response	
4.	pathogens such as viruses?		Which of the following innate immune cells act by targeting intracellular

Name:	a. B lymphocyte	c. CD8+ T lymphocyte
	b. CD4+ T lymphocyte	d. Natural killer cell
5.	response of the child?	A 7-year-old child was playing in the park when he got stung by a bee. Within minutes, he developed rashes and severe difficulty of breathing. Which of the following is the mechanism involved in the type of immune
	a. histamine	Binding of IgE-allergen complex to surface of mast cells with release of
	b.	Activation of classical complement pathway with production of C3b
	c. endothelium	Formation of immune complexes in the circulation with deposition on
6.	reaction exemplifies which type of hypersensitivity response?	A patient underwent blood transfusion due to bleeding. Within minutes into the transfusion the patient started to develop chills. Transfusion
	a. Type I	c. Type III
	b. Type II	d. Type IV
7.	The following are features of IgM, except:	
	a. Pentameric with J-chain	
	b. Can activate or fix complement	
	c. Able to cross the placenta	
	d. Predominant in acute inflammation	
8.	hepatitis B infection?	Which hypersensitivity reaction has been implicated in patients with
	a. Type I	c. Type III
	b. Type II	d. Type IV
9.	Which immunoglobulin respiratory and gastrointestinal tract infections?	is important in preventing occurrence of
	a. IgA	c. IgG
	b. IgE	d. IgM
10.	is an example of which type of vaccine?	The COVID-19 vaccine utilizes the spike protein of the causative virus. This
	a. Killed vaccine	c. Live, attenuated vaccine

6. Property	b. Inactivated vaccine reaction exemplifies which type of hypersensitivity response? Exotoxin	d. Subunit vaccine A patient underwent blood transfusion due to bleeding. Within minutes into the transfusion the patient started to develop chills. Endotoxin
Bacterial source	Mostly gram-positive bacteria; some gram-negative bacteria	Gram-negative bacteria only
Relation to microorganism	Metabolic product of growing cell; secreted outside cell	Present in LPS of outer membrane of cell wall; released after lysis of cell wall
Toxicity	Extremely toxic; sometimes fatal	Weakly toxic
Chemistry	Protein or short peptides	Lipid A of LPS of outer membrane
Pharmacology (effect on the body)	Specific for a particular cell structure or function in the host (mainly affects cell functions, nerves, and GIT)	General, such as fever, malaise, and shock; all produce the same effects
Antigenicity	Extremely antigenic	Less antigenic
Enzymatic activity	Yes	No
Heat stability	Heat-labile (except staphylococcal enterotoxin)	Heat-stable
Fever production	No	Yes
Specificity	High degree	Low degree
Relation to antibodies	Can be converted to toxoids; neutralized by anti-toxins	Cannot be converted to toxoids; not neutralized by antitoxins
Denaturation on boiling	Yes	No
Location of genes	Present on plasmids or bacteriophages	Bacterial chromosome
Representative diseases	Gas gangrene, botulism, diphtheria, tetanus, scarlet fever	Typhoid fever, urinary tract infections, meningococcal meningitis, and meningococcemia

Name:		Score:	
Section:		Date:	
	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.		
1.	other?	Which of the following is a form of symbiotic relationship where one organism benefits from another and at the same time causes harm to the	
	a.	Parasitism	c. Commensalism
	b.	Mutualism	d. Synergism
2.	microorganisms?	Which of the following provides a continual source of disease-causing	
	a.	Reservoir	c. Portal of Entry
	b.	Portal of exit	d. Host
3.	for a prolonged period of time after developing the initial infection?	Which of the following refers to an individual who harbors the organism	

Name:	a.	Asymptomatic carrier	c.	Incubatory carrier
	b.	Chronic carrier	d.	Convalescent carrier
4.		a birthday party. This is an example of which mode of transmission?		A 6-year-old child was brought to the Emergency Room (ER) due to vomiting and diarrhea a few hours after eating spaghetti that was served at
	a.	Person-to-person contact	c.	Vector transmission
	b.	Vehicle transmission	d.	Airborne transmission
5.		following is the probable mode of transmission involved?		A 25-year-old male had casual sex with a female he met at a party. A week later, he noted purulent discharge coming from his penis. Which of the
	a.	Direct contact	c.	Droplet transmission
	b.	Vehicle transmission	d.	Vector transmission
6.	A 16-year-old female was rushed to the ER because of high-grade			
		meningococemia. This illustrates what type of infection?		fever, vomiting, and skin rash. Within 6 hours of admission, the patient went into cardiac arrest and expired. The admitting impression was
	a.	Localized infection	c.	Systemic infection
	b.	Fulminant infection	d.	Subclinical infection
7.		to another is referred to as which of the following?		In the chain of infection, how the organisms move around from one person
	a.	Reservoir	c.	Portal of entry
	b.	Portal of exit	d.	Mode of transmission
8.		types of infection?		A 35-year-old male patient diagnosed with AIDS developed symptoms consistent with pneumonia due to <i>Pneumocystis jirovecii</i> infection. The pulmonary problem in this case is an example of which of the following
	a.	Community-acquired infection		
	b.	Nosocomial infection		
	c.	Secondary infection		
	d.	Primary infection		
9.		an example of which mechanism of disease production?		<i>Entamoeba histolytica</i> is a protozoan that causes the disease amoebiasis. The organism reaches the intestines and releases enzymes that cause lysis of underlying tissues causing development of a "flask-shaped" ulcer. This is
	a.	Mechanical	c.	Immunological
	b.	Chemical	d.	a and b only
10.		process?		A 50-year-old diabetic was exposed to a neighbor who had COVID-19. After 5 days, he started to manifest with cough, colds, and difficulty of

6. breathing. The patient can be said to be in which stage of the infection
A 16-year-old female was rushed to the ER because of high-grade

a.
Incubation period

c.
Period of illness

b.
Prodromal period

d.
Period of defervescence

Type of Parasite

Obligatory parasite	Parasite that cannot survive outside the host
Facultative parasite	Parasite capable of existing independently of the host
Endoparasite	Parasite that is established inside the host
Ectoparasite	Parasite that is established in or on the exterior surface of host
Type of Host	
Accidental or incidental host	Host other than the normal one that is harboring a parasite
Definitive host	Host in which the adult/sexual phase of parasite development occurs
Intermediate host	Host in which the larval/asexual phase of parasite development occurs
Reservoir host	Host harboring parasites that are parasitic for humans and from which humans may become infected
Transport/Paratenic host	Host responsible for transferring a parasite from one location to another
Parasite-Host Relationships	
Symbiosis	Living together; the association between two living organisms, each of different species.
Commensalism	Association between two different species of organisms that is beneficial to one and neutral to the other.
Mutualism	Association between two different species of organisms that is beneficial to both.
Parasitism	Association between two different species of organisms in which one benefits at the other's expense.

Reaction	Mechanism	Result	Example
Type 1: allergy or anaphylactic	Parasite antigen + IgE attach to mast cells, causing histamine release.	Anaphylactic shock; bronchospasm; local inflammation	Helminths; African trypanosomiasis
Type 2: antibody mediated	Antibody + parasite antigen on cell surface cause activation of complement activation or natural killer cells.	Lysis of cell-bearing parasite antigens	Trypanosoma cruzi
Type 3: immune complex	Antibody + extracellular antigen complex with deposition on endothelium of blood vessels	Inflammation and tissue damage; complex deposition in organs and tissues	Malaria, schistosomiasis, trypanosomiasis

Reaction	Mediators	T cell reaction with	Result	Example
cell	antigen, release of lymphokines,		inflammation, mononuclear	schistosomiasis,
mediated	triggered cytotoxicity		accumulation, macrophage	trypanosomiasis

Parasite						Biologic, Morphologic, and Physiologic Characteristics							
Protozoa													
Amoeba		Unicellular; cyst and trophozoite forms		Binary fission				Pseudopods		Facultative anaerobe		Assimilation by pinocytosis or phagocytosis	
Flagellates		Unicellular; cyst and trophozoite forms		Binary fission				Flagella		Facultative anaerobe		Simple diffusion or ingestion via cytostome, pinocytosis, or phagocytosis	
Ciliates		Unicellular; cyst and trophozoite forms		Binary fission or conjugation				Cilia		Facultative anaerobe		Ingestion via cytostome, food vacuole	
Sporozoa		Unicellular, frequently intracellular; multiple forms, including trophozoites, sporozoites, cysts (oocysts), gametes		Schizogony and sporogony				None		Facultative anaerobe		Simple diffusion	
Helminths													
Cestodes		Multicellular; head with segmented body (proglottids); lack of digestive tract; head equipped with hooks and/or suckers for attachment		Hermaphroditic				No single organelle; usually attachment to mucosa; possible muscular motility (proglottids)		Adults usually anaerobic		Absorption of nutrients from intestines	
Trematodes		Multicellular; leaf shaped with oral and ventral suckers, and blind alimentary tract		Hermaphroditic; Schistosoma spp. has separate sexes				No single organelle; muscle directed motility		Adults usually anaerobic		Ingestion or absorption of body fluids, tissue, or digestive contents	
Nematodes		Multicellular; round, smooth, spindle shaped, tubular digestive tract; possibility of teeth or plates for attachment		Separate sexes				No single organelle; active muscular motility		Adults usually anaerobic; larvae possibly aerobic		Ingestion or absorption of body fluids, tissue, or digestive contents	

Name:	Score:
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Section:
Name:

Date:
Score:

		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.	
1.		the relationship between normal intestinal flora and humans?	Which of the following is a form of symbiotic relationship exemplified by
	a.	Parasitism	c. Commensalism
	b.	Mutualism	d. Antagonism
2.		milk?	Which of the following parasites may be transmitted through mother's
	a.	Ascaris	c. Giardia
	b.	Enterobius	d. Strongyloides
3.		takes place?	Which of the following is a type of host where sexual stage of the parasite
	a.	Reservoir host	c. Intermediate host
	b.	Paratenic host	d. Definitive host
4.		infection with which of the following parasites?	Development of cancer of the urinary bladder has been associated with
	a.	Schistosoma japonicum	c. Clonorchis sinensis
	b.	Plasmodium falciparum	d. Schistosoma haematobium
5.		penetration?	Which among the following parasites can be transmitted through skin
	a.	Trichomonas vaginalis	c. Enterobius vermicularis
	b.	Strongyloides stercoralis	d. Balantidium coli
6.		locomotion?	Which of the following protozoan parasites possesses pseudopodia for
	a.	Balantidium coli	c. Plasmodium falciparum
	b.	Entamoeba histolytica	d. Schistosoma japonicum
7.		which of the following parasites?	Xenodiagnosis is a special method of diagnosis to detect the presence of
	a.	Trichomonas vaginalis	c. Trypanosoma cruzi
	b.	Ascaris lumbricoides	d. Enterobius vermicularis
8.		infection with Entamoeba histolytica?	Which of the following is the mechanism involved in the pathogenesis of
	a.	Traumatic damage	
	b.	Lytic necrosis	
	c.	Stimulation of host tissue reaction	
	d.	Toxic and allergic reactions	
9.		vectors, except:	The following parasites are transmitted by bite of blood-sucking insect
	a.	Toxoplasma gondii	c. Leishmania spp.

6. 10.	b.	Trypanosoma spp. locomotion? parasites?	d.	Plasmodium spp. Which of the following protozoan parasites possesses pseudopodia for Which of the following is the most common source of infection for
	a.	Another person or his clothing		
	b.	Food containing the infective stage of the parasite		
	c.	A blood-sucking insect		
	d.	Soil contaminated with human feces		

Parameter	Trophozoite	Cyst
Size range	8–65 µm	8–22 µm
Shape	Irregular	Spherical to round
Motility	Yes (with finger-like pseudopodia)	No
Number of nuclei	One	One to four
Karyosome	Small and central	Small and central
Peripheral chromatin	Fine and evenly distributed	Fine and evenly distributed
Cytoplasm	Finely granular	Finely granular
Cytoplasmic inclusions	Ingested red blood cells	Chromatoid bars and diffuse glycogen mass in young cysts

	<i>P. falciparum</i>	<i>P. malariae</i>	<i>P. vivax</i>	<i>P. ovale</i>
Young trophozoite	<ul style="list-style-type: none"> • fine ring • multiple infection • crescent-shaped mass at outer edge of RBC (accolé form); one to two small chromatin dots • only detected in severe infection 	<ul style="list-style-type: none"> • thick ring; one chromatin dot • similar to <i>P. vivax</i> but smaller 	<ul style="list-style-type: none"> • thick ring, often irregular amoeboid appearance; one chromatin dot 	<ul style="list-style-type: none"> • thick ring; one chromatin dot • circular shape
Mature trophozoite	<ul style="list-style-type: none"> • ring enlarged; slightly irregular 	<ul style="list-style-type: none"> • round with central chromatin and band forms; pigment (hemozoin) distinct 	<ul style="list-style-type: none"> • irregular, amoeboid 	<ul style="list-style-type: none"> • round, compact
Schizont	<ul style="list-style-type: none"> • 8–36 merozoites in cluster or rosette arrangement; ring enlarged; only detected in severe infections 	<ul style="list-style-type: none"> • 6–12 merozoites arranged in rosettes or irregular clusters; central location of brown green pigment 	<ul style="list-style-type: none"> • 12–24 merozoites arranged irregularly 	<ul style="list-style-type: none"> • 8–14 merozoites with rosette arrangement
Gametocyte	<ul style="list-style-type: none"> • crescentic • male: reddish with diffuse chromatin • female: bluish with 	<ul style="list-style-type: none"> • oval or rounded • male: diffuse chromatin 	<ul style="list-style-type: none"> • oval or rounded • male: diffuse chromatin 	<ul style="list-style-type: none"> • oval or rounded • male: diffuse chromatin

	compact chromatin <i>P. falciparum</i>	<i>P. malariae</i>	<i>P. vivax</i>	<i>P. ovale</i>
Size of infected red cell	Unchanged	Unchanged or smaller	Enlarged	Enlarged
Shape of red cell	Sometimes irregular and crenated	Unchanged	Unchanged	Often irregular with jagged edges
Stippling	Sometimes present (Maurer's dots)	Rarely present (Ziemann's dots)	Often present (Schüffner's dots)	Always present (Schuffner's or James' dots)

	<i>P. Vivax</i>	<i>P. Ovale</i>	<i>P. Malariae</i>	<i>P. Falciparum</i>
Ring Stage				
Trophozoite				
Schizont				
Segmenter				
Gametocytes				sequestered

Name:		Score:	
Section:			Date:
	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.		
1.	an insect vector?		Infection with which of the following parasites is acquired through bite of
	a. Balantidium coli	d.	a and b only
	b. Giardia lamblia	e.	a, b, and c
	c. Leishmania donovani		
2.	contaminated water?		Which among the following parasites is acquired through swimming in
	a. Balantidium coli	c.	Entamoeba histolytica
	b. Naegleria fowleri	d.	Toxoplasma gondii
3.	Quotidian malaria is caused by which of the following?		
	a. Plasmodium vivax	d.	Plasmodium falciparum
	b. Plasmodium ovale	e.	Plasmodium knowlesi
	c. Plasmodium malariae		
4.	transmission?		Infection with which among the following parasites is through sexual
	a. Trichomonas	c.	Leishmania
	b. Plasmodium	d.	Entamoeba
5.	Which among the following statements is true of Entamoeba histolytica?		

Name:	a. food and water.	It is primarily transmitted by ingestion of trophozoite in contaminated
	b. Food is the major source of infection of the parasite.	
	c. Cysts are usually found in diarrheic stool.	
	d. The pathogenic stage of the parasite is the trophozoite.	

6.	man facies" appearance?	The cyst stage of which among the following parasites is described as "old"
	a. Entamoeba histolytica	Balantidium coli
	b. Giardia lamblia	d. Trichomonas vaginalis
7.	Plasmodium falciparum?	Which of the following are seen within red blood cells infected with
	a. Maurer's dots	c. Schuffner's dots
	b. Ziemann's dots	d. James' dots
8.		Which of the following is the insect vector for Trypanosoma brucei?
	a. Anopheles mosquito	c. Tsetse fly
	b. Aedes mosquito	d. Triatoma or reduviid bug
9.		Which of the following parasites exists in trophozoite form only?
	a. Toxoplasma	c. Entamoeba
	b. Trichomonas	d. Trypanosoma
10.	parasites?	Congenital infection is seen in infection with which of the following
	a. Trichomonas vaginalis	c. Toxoplasma gondii
	b. Trypanosoma cruzi	d. Trypanosoma brucei

Characteristics	Taenia saginata	Taenia solium
Scolex		
Number of suckers	Four	Four
Rostellum	Absent	Present
Hooks	Absent	Present; double crown
Gravid Proglottid		
Appearance, shape	Rectangular	Somewhat square
Number of uterine branches on each side of uterus	15-30	7-15

Name:	Score:
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Section: Name:			Date: Score:
		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.	
1.		Which of the following is not a property of cestodes?	
a.	All are hermaphroditic.		
	b.	The organ of attachment is the neck.	
	c.	Hooks may be attached to a rostellum.	
	d.	Majority involve fecal-oral transmission.	
2.		The intermediate host for which of the following is cattle?	
	a.	Taenia saginata	c. Taenia solium
	b.	Diphyllobothrium latum	d. Echinococcus granulosus
3.		of the following is correct regarding the parasite involved?	A 20-year-old male sought consult because of muscle pain. History revealed that he is fond of eating half-cooked meat (beef and pork). Which
	a.	The infective stage in this case is the ova of the parasite.	
	b.	Involvement of the nervous system is usually mild.	
	c.	Autoinfection does not occur.	
	d.		Pigs are the definitive hosts while humans are the intermediate hosts.
4.		Which of the following cestodes has two intermediate hosts?	
	a.	Taenia solium	c. Taenia saginata
	b.	Echinococcus granulosus	d. Diphyllobothrium latum
5.			Pruritus ani may occur in patients infected with which of the following?
	a.	Hymenolepis nana	c. Both a and b are correct
	b.	Taenia saginata	d. Neither a nor b are correct
6.	Taenia solium?	Which of the following is a feature associated with Taenia saginata, not	
	a.	Hooks are absent.	
	b.	Gravid segment is somewhat square.	
	c.	Rostellum is present.	
	d.	All of the above	

7.	Which of the following is the longest of the <i>Taenia solium</i> ?	Which of the following is a feature associated with <i>Taenia saginata</i> , not
	a. Diphyllbothrium latum	c. Hymenolepis nana
	b. Echinococcus granulosus	d. Taenia solium
8.		Infection with the broad fish tapeworm can lead to which of the following?
	a. Vitamin B12 deficiency	c. Pernicious anemia
	b. Iron-deficiency anemia	d. Microcytic, hypochromic anemia
9.	Which of the following is true of Echinococcus granulosus?	
	a. The diagnostic stage is the cyst.	
	b. The infective stage is the adult worm.	
	c. Embryos are encased within hydatid cyst.	
	d. a and c only	
10.		Which of the following does not require an obligatory intermediate host?
	a. Diphyllbothrium latum	c. Hymenolepis nana
	b. Echinococcus granulosus	d. Taenia solium

Name:

Score:

Section:

Date:

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

1.	improperly cooked aquatic vegetation?	Infection with which of the following is acquired through ingestion of
	a. Fasciola hepatica	d. a and b only
	b. Fasciolopsis buski	e. b and c only
	c. Paragonimus westermani	
2.	sinensis?	Which among the following is the second intermediate host of Clonorchis
	a. Freshwater fish	c. Freshwater snail
	b. Crab or crayfish	d. Aquatic vegetation
3.		Which among the following schistosomes has predilection for the liver?
	a. Schistosoma japonicum	c. Schistosoma mansoni
	b. Schistosoma haematobium	d. a and c only
4.	Which among the following is not a characteristic of blood flukes?	
	a. Transmitted by skin penetration	
	b. Second intermediate host is a snail	

Name:	c. Has male and female worms	Score:
	d. Infective stage is fork-tailed cercaria	
5.		Infection with which of the following can mimic pulmonary tuberculosis?
	a. Clonorchis sinensis	c. Paragonimus westermani
	b. Fasciola hepatica	d. Schistosoma japonicum
6.	The egg of which of the following has a large terminal spine?	
	a. Schistosoma mansoni	c. Schistosoma japonicum
	b. Schistosoma haematobium	d. a and b only
7.		The temporary lodgement of adult worms in the pharynx causing suffocation is associated with which of the following parasites?
	a. Fasciolopsis buski	c. Paragonimus westermani
	b. Fasciola hepatica	d. Schistosoma japonicum
8.	Which of the following is true of Katayama fever?	
	a. It occurs with all species of Schistosoma.	
	b.	It occurs within hours of exposure to the schistosomes.
	c.	The most common cause of death is bleeding from ruptured varices.
	d. Portal hypertension does not develop.	
9.	the following organs?	Clonorchis sinensis is associated with development with cancer in which of
	a. Bile ducts	c. Liver
	b. Colon	d. Urinary bladder
10.	liver?	Which of the following can be transmitted through ingestion of raw sheep
	a. Fasciolopsis buski	c. Schistosoma japonicum
	b. Clonorchis sinensis	d. Fasciola hepatica

Parasite/ Disease	Site of Infection	Mode of Transmission	Diagnosis	Treatment
Enterobius vermicularis (Pinworm)	Lumen of cecum, colon	Ingestion of eggs; self-contamination or autoinfection	Scotch Tape test; microscopy for eggs	Pyrantel pamoate, mebendazole
Trichuris trichiura (Whipworm)	Cecum, colon	Ingestion of eggs from fecally-contaminated soil or food	Stool exam for eggs	Mebendazole, albendazole, pyrantel pamoate

Ascaris lumbricoides (Common roundworm)	Small intestines; larvae through lungs	Ingestion of eggs from fecally contaminated soil or food	Stool exam for eggs, sputum exam for larvae	Albendazole, mebendazole
Ancylostoma duodenale, Necator americanus (Human hookworms)	Small intestines; larvae through skin, lungs	Larvae in soil penetrate skin	Stool exam for eggs; sputum exam for larvae	Albendazole, mebendazole
Strongyloides stercoralis (Threadworm)	Small intestines; larvae through skin, lungs	Larvae in soil penetrate skin; autoinfection (rare)	Stool exam, sputum exam or bronchial lavage for larvae serology	Ivermectin, albendazole

Parasite/Disease	Site of Infection	Mode of Transmission	Diagnosis	Treatment
Trichinella spiralis (Muscle worm)	Adults in small intestines for 1–4 months; larvae encysted in muscle tissue	Eating undercooked, infected pork or other animal	Serology and muscle biopsy (larvae)	Albendazole + steroids (for severe symptoms)
Wuchereria bancrofti, Brugia malayi (Filarial worms)	Adult worms in lymph nodes, lymphatic ducts	Bite of mosquitoes transmit larvae	Blood smear for microfilariae	Diethylcarbamazine

Name:		Score:	
Section:		Date:	
	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.		
1.	among the following nematodes?	Larval migration to the lungs or lung phase is seen in the life cycle of which	
	a. Ascaris lumbricoides	d.	a and b only
	b. Ancylostoma duodenale	e.	a, b, and c
	c. Strongyloides stercoralis		
2.	food or water containing the infective ova?	Infection with which among the following is acquired through ingestion of	
	a. Trichuris, Strongyloides, Enterobius		
	b. Ancylostoma, Necator, Strongyloides		
	c. Ascaris, Trichinella, Capillaria		
	d. Enterobius, Ascaris, Trichuris		
3.	rather than Ancylostoma duodenale?	Which of the following is a feature more associated with Necator americanus	
	a. Buccal capsule with a pair of cutting plates		
	b. Acquired through skin penetration		
	c. With a lung phase in its life cycle		
	d. Pruritic vesicles at the site of skin penetration		

4. Name:		Cochin China diarrhea is associated with which of the following parasites?	
	a. Ascaris lumbricoides	c. Trichuris trichiura	
	b. Enterobius vermicularis	d. Strongyloides stercoralis	
5. Which of the following parasites is also known as threadworm?			
	a. Ascaris lumbricoides	c. Enterobius vermicularis	
	b. Strongyloides stercoralis	d. Trichuris trichiura	
6.			The natural hosts for which of the following parasites are migratory birds?
	a. Necator americanus	c. Strongyloides stercoralis	
	b. Trichinella spiralis	d. Capillaria philippinensis	
7.	face, fever, muscle pain, and rashes?		Infection with which of the following parasites manifest as edema of the
	a. Strongyloides stercoralis	c. Trichinella spiralis	
	b. Ancylostoma duodenale	d. Ascaris lumbricoides	
8.	Löffler syndrome is associated with which of the following parasites?		
	a. Strongyloides stercoralis	c. Trichinella spiralis	
	b. Ancylostoma duodenale	d. Ascaris lumbricoides	
9.	parasites?		The cellophane test is used to diagnose presence of which of the following
	a. Ascaris lumbricoides	c. Necator americanus	
	b. Enterobius vermicularis	d. Wuchereria bancrofti	
10.	leading to edema of the extremities?		Which of the following parasites can cause obstruction of lymphatic vessels
	a. Trichinella spiralis	c. Wuchereria bancrofti	
	b. Strongyloides stercoralis	d. Capillaria philippinensis	

Name:		Score:	
Section:		Date:	
	questions. Write the letter of the correct answer on the space provided.		CASE ANALYSIS. Read and analyze the case study, then answer the following
			Case: A 7-year-old boy was brought by his mother to the OPD because of lesions on the skin described as scaly, ring-shaped, expanding lesions with central clearing scattered on his trunk. The lesions were described as very itchy. A fungal infection is considered.
1.	What is the probable diagnosis?		
	a. Pityriasis versicolor	c. Tinea nigra	
	b. Tinea corporis	d. Sporotrichosis	

Name:	depth of involvement?	Score:	The patient's infection can be classified as which of the following based on
	a. Superficial mycosis		c. Cutaneous mycosis
	b. Subcutaneous mycosis		d. Systemic mycosis
3.	skin of infected individuals?		Which of the following organisms produces skin lesions that are described as cauliflower-like in appearance and are acquired through contact with
	a. Herpes simplex 1		c. Sporothrix schenckii
	b. Human papillomavirus		d. Madurella spp.
4.	following characterizes the probable causative agent?		You consult your dermatologist because of several "pimple-like" lesions on your scalp that looked infected. The diagnosis was folliculitis. Which of the
	a. Gram-positive diplococci, lancet-shaped		
	b. Gram-positive cocci in clusters		
	c. Gram-positive cocci, beta-hemolytic		
	d. Gram-positive bacilli, anaerobic		
5.	reactivation of lesions?		Which of the following is characterized by periods of latency with
	a. Human papillomavirus		c. Sporothrix schenckii
	b. Malassezia furfur		d. Herpes simplex virus
6.	Which of the following is a common cause of stitch abscesses?		
	a. Staphylococcus aureus		c. Pseudomonas aeruginosa
	b. Staphylococcus epidermidis		d. Streptococcus pyogenes
7.	involving the heart and kidneys?		Which of the following is associated with non-suppurative complications
	a. Staphylococcus aureus		c. Pseudomonas aeruginosa
	b. Staphylococcus epidermidis		d. Streptococcus pyogenes
8.	Which of the following is a dermatophyte infection involving the groin?		
	a. Tinea corporis		c. Tinea cruris
	b. Tinea barbae		d. Tinea unguium
9.	with gas gangrene?		Which of the following is a feature of the organism commonly associated
	a. Spore forming		d. a and b only
	b. Gram-negative bacilli		e. a, b, and c
	c. Anaerobic		
10.	Which of the following is also known as the "flesh-eating" bacteria?		
	a. Staphylococcus aureus		c. Staphylococcus epidermidis

5. b. *Streptococcus pyogenes*

d. Which of the following is characterized by periods of latency with
Pseudomonas aeruginosa

Category	Agents
Common viruses that usually cause the common cold	Rhinovirus (most common) Parainfluenza viruses Respiratory syncytial virus Coronavirus
Common infectious agents that occasionally cause illness with common cold symptoms	Adenoviruses Enteroviruses Influenza viruses Reoviruses Mycoplasma pneumoniae

Category	Agents
Illnesses with initial symptoms suggestive of the common cold	Coccidioides immitis
	Histoplasma capsulatum
	Bordetella pertussis
	Chlamydia psittaci
	Coxiella burnetii

Organism	Clinical Setting	Gram-Stained Smears of Sputum	Complications	Preferred Antimicrobial Therapy
<i>Streptococcus pneumoniae</i>	Chronic cardio pulmonary disease; follows URT infections	Gram-positive diplococci	Bacteremia, meningitis, endocarditis, empyema, pericarditis	Penicillin G (or V, oral); fluoroquinolones or vancomycin for highly penicillin resistant
<i>Haemophilus influenzae</i>	Chronic cardio pulmonary disease; follows URT infections	Small gram negative coccobacilli	Empyema, endocarditis	Ampicillin or amoxicillin; Cefotaxime or ceftriaxone
<i>Staphylococcus aureus</i>	Influenza epidemics; nosocomial	Gram-positive cocci in clusters	Empyema, cavitation	Nafcillin
<i>Klebsiella pneumoniae</i>	Alcohol abuse, DM; nosocomial	Gram-negative encapsulated rods	Empyema, cavitation	Third or fourth generation Cephalosporin + gentamicin or tobramycin
<i>Escherichia coli</i>	Nosocomial; rarely community acquired	Gram-negative rods	Empyema	Third-generation cephalosporin
<i>Pseudomonas aeruginosa</i>	Nosocomial; cystic fibrosis	Gram-negative rods	Cavitation	Anti-pseudomonal cephalosporin or carbapenem + aminoglycoside
<i>Mycoplasma pneumoniae</i>	Young adults	PMNs and monocytes; no bacterial pathogens	Skin rashes, hemolytic anemia	Erythromycin, azithromycin or clarithromycin; doxycycline, fluoroquinolones

Organism	Clinical Setting	Gram-Stained Smears of Sputum	Complications	Preferred Antimicrobial Therapy
Legionella sp.	Exposure to contaminated construction site, water source, air conditioner; community acquired or nosocomial	Few PMNs; no bacteria	Empyema, cavitation, endocarditis, pericarditis	Azithromycin or clarithromycin with or without rifampin; fluoroquinolones
Pneumocystis jirovecii	AIDS, immune suppressive therapy	Not helpful in diagnosis	Pneumothorax, respiratory failure, acute respiratory distress syndrome, death	Trimethoprim sulfamethoxazole, pentamidine isethionate

Name:		Score:	
Section:		Date:	
	questions. Write the letter of the correct answer on the space provided.		CASE ANALYSIS. Read and analyze the case study, then answer the following
	severe difficulty of breathing. RT-PCR was requested.		Case: A 65-year-old diabetic male was brought to the ER due to severe shortness of breath. Condition started 7 days after he was exposed to a relative who had flu-like illness. His condition started as sore throat, fever, myalgia, and cough. After 2 days, he complained of loss of taste and smell. Few hours prior to admission, he developed
1.	Which of the following will be your consideration?		
	a. Bacterial pneumonia	c. COVID-19	
	b. Chronic bronchitis	d. Influenza	
2.	likely involved?		If RT-PCR is positive for an RNA virus, which of the following is most
	a. Influenza A virus	c. Respiratory syncytial virus	
	b. Adenovirus	d. SARS-CoV-2	
3.	Which of the following statements is true regarding influenza virus?		
	a. N antigens.		Antigenic shift results from genetic reassortment involving the H and
	b. Influenza C virus causes both epidemics and pandemics.		
	c.		Antigenic drift is a major change involving the N antigen of the virus.
	d. All of the above		
4.	it does not possess a cell wall?		Which of the following cannot be destroyed by cell wall inhibitors because
	a. Mycoplasma pneumoniae	c. Corynebacterium diphtheriae	
	b. Haemophilus influenzae	d. Mycobacterium tuberculosis	

5.	the lungs?	Primary infection with <i>Mycobacterium tuberculosis</i> involves which part of			
	a. Upper lobe only		c. Middle and lower lobes		
	b. Upper and middle lobes		d. Lower lobe only		
6.	Which of the following is not a clinical feature of pertussis?				
	a. Inspiratory whoop		c. Seal bark cough		
	b. Paroxysmal cough		d. Rust-colored sputum		
7.	Which of the following is the most common cause of the common cold?				
	a. Rhinovirus		c. Coronavirus		
	b. Influenza virus		d. Adenovirus		
8.	Woolsorter's disease is caused by which of the following organisms?				
	a. <i>Bacillus anthracis</i>		c. <i>Haemophilus influenzae</i>		
	b. <i>Streptococcus pneumoniae</i>		d. <i>Pseudomonas aeruginosa</i>		
9.	the other streptococci?		Which of the following tests will differentiate <i>Streptococcus pneumoniae</i> from		
	a. Gram stain		c. Optochin test		
	b. Culture		d. Catalase test		
10.	of infected patients?		Which of the following organisms is part of transient flora of the nasopharynx and produces infection characterized by bull neck appearance		
	a. <i>Bordetella pertussis</i>		c. <i>Legionella pneumophila</i>		
	b. <i>Corynebacterium diphtheriae</i>		d. <i>Streptococcus pneumoniae</i>		

Feature	Hepatitis A	Hepatitis B	Hepatitis C	Hepatitis D	Hepatitis E
Common name	"Infectious"	"Serum"	"Non-A, non-B post transfusion"	"Delta agent"	"Enteric non-A, non-B"
Virus structure	Picornavirus; capsid RNA	Hepadnavirus; envelope, DNA	Flavivirus; envelope, RNA	Viroid-like; envelope, circular RNA	Hepevirus; Calicivirus like capsid
Transmission	Fecal-oral	Parenteral, sexual, insidious	Parenteral, sexual, insidious	Parenteral, sexual	Fecal-oral
Incubation period (days)	15–50	45–160	14–180+	15–64	15–50
Severity	Mild	Occasionally severe	Usually sub clinical; 70% chronicity	Co-infection or super infection with HBV	Normal patients, mild; pregnant women, severe
Chronicity/Carrier state	No	Yes	Yes	Yes	No

Feature	Hepatitis A	Hepatitis B Primary	Hepatitis C Primary	Hepatitis D	Hepatitis E
Other disease associations	None	hepato-cellular carcinoma, cirrhosis	hepato-cellular carcinoma, cirrhosis	Cirrhosis, fulminant hepatitis	None
Laboratory diagnosis	Symptoms and anti-HAV IgM	Symptoms and serum levels of HBsAg, HBeAg, and anti-HBc IgM	Symptoms and anti-HCV ELISA	Anti-HDV ELISA	—

	Non-invasive Diarrhea	Invasive Diarrhea
Characteristic of stool	Profuse, secretory (severe, watery)	Dysenteric (blood, mucus, white blood cells)
Fever	No	Yes
Systemic toxicity	No	Yes
Abdominal pain	Mild	Severe (cramping; tenesmus)
Site of infection	Small intestine	Colon (large intestine)

Virus	Host Age	Mode of Transmission	Epidemiology
Rotaviruses			
Group A	6–24 months	Person-to-person; water	Single most important cause of endemic severe diarrheal illness in infants and young children
Group B	Adults and children	Person-to-person; water	Outbreaks of diarrhea in China
Group C	Children	Person-to-person; water	Sporadic and occasional outbreaks
Enteric adenoviruses (Group F or serotypes 40 and 41)	Child < 2 years of age	Person-to-person	Second most important viral agent of endemic diarrhea in infants and young children worldwide

Virus	Host Age	Mode of Transmission	Epidemiology
Caliciviruses			
Norovirus	Older children and adults	Person-to-person, water, cold foods, raw shellfish	Causes outbreaks of vomiting and diarrhea in families, communities, and institutions
Sapovirus	Infants, young children, elderly		Sporadic and occasional outbreaks
Astroviruses	Infants, young children, elderly	Person-to-person, water, raw shellfish	Sporadic and occasional outbreaks

Organism	Incubation period (hours)	Clinical presentation	Characteristic foods
Bacillus cereus	1–6	Vomiting	Re-warmed fried rice
	6–24	Watery diarrhea	Meat, poultry, vegetable

Organism	Incubation period (hours)	Clinical presentation	Characterised foods
<i>Clostridium botulinum</i>	12–17	Neuromuscular paralysis	Canned foods, smoked fish, charcuterie
<i>Staphylococcus aureus</i>	2–4	Vomiting, diarrhea	Meats, custard, salads
<i>Vibrio parahaemolyticus</i>	10–24	Watery diarrhea	Shellfish
<i>Clostridium perfringens</i>	9–15	Watery diarrhea	Meat, poultry

	<i>Vibrio cholera</i>	<i>Escherichia coli</i>	<i>Clostridium perfringens</i>	<i>Bacillus cereus</i>	<i>Staphylococcus aureus</i>
Incubation (hours)	12–72	24–72	6–12	3–8	1–6
Abdominal cramps	--	+	++++	++	++
Vomiting	+	+/-	+	++	++++

	<i>Shigella</i> spp.	<i>Escherichia coli</i>	<i>Salmonella</i> spp.	<i>Yersinia enterocolitica</i>
Incubation (hours)	24–72	24–72	8–48	1–6
Abdominal cramps	++++	++++	+	++
Vomiting	++	++	++++	++
Fever	++	++	++++	++

Organism	Pathogenic Mechanism	Source	Clinical Features
<i>Escherichia coli</i>			
EPEC+	Cholera-like toxin, no invasion	Food, water	Traveler's diarrhea Watery diarrhea
STEC+	Shiga-like toxin, no invasion	Undercooked beef products	Hemorrhagic colitis, HUS*
EPEC+	Attachment, enterocyte effacement	Weaning foods, water	Watery diarrhea
EIEC+	Invasion, local spread	Cheese, water, person-to-person	Fever, pain, diarrhea, dysentery

Organism	Pathogenic Mechanism	Source	Clinical Features
<i>Salmonella</i> spp.	Invasion, dissemination	Milk, beef, eggs, poultry	Fever, pain, diarrhea or dysentery, bacteremia, extra-intestinal infection
<i>Shigella</i> spp.	Invasion, local spread	Person-to-person, low inoculum	Fever, pain, diarrhea, HUS, dysentery, epidemic spread
<i>Yersinia enterocolitica</i>	Invasion, dissemination	Milk, pork	Fever, pain, diarrhea, extra-intestinal infection
<i>Vibrio cholerae</i>	Enterotoxin, no invasion	Water, shellfish, person-to-person	Watery diarrhea, pandemic spread
<i>Clostridium difficile</i>	Cytotoxin, local invasion	Nosocomial spread	Fever, pain, bloody diarrhea, following antibiotic use

Clostridium perfringens	Enterotoxin, no invasion	Meat, poultry, fish	Watery diarrhea, food sources
Organism	Pathogenic Mechanism	Source	Clinical Features
Mycobacterium tuberculosis	Invasion, inflammation with necrosis and scarring	Contaminated milk, swallowing of coughed-up organisms	Chronic abdominal pain; complications of malabsorption, stricture, perforation, fistulae, hemorrhage

Name:		Score:	
Section:			Date:
	questions. Write the letter of the correct answer on the space provided.		CASE ANALYSIS. Read and analyze the case study, then answer the following
and salad were served.			Case: A group of children were rushed to the emergency department presenting with nausea and vomiting several hours after they attended a birthday party where spaghetti
1.	Which of the following would be the primary consideration?		
a.	Typhoid fever		
b.	Staphylococcal food poisoning		
c.	Shigellosis		
d.	Salmonella enterocolitis		
2.	development of the symptoms of the children?		Which of the following is the probable mechanism involved in the
a.	Invasion and destruction of mucosal epithelial cells		
b.	Elaboration of a cytotoxin by the organism		
c.	Presence of preformed toxin in the contaminated food		
d.			Stimulation of excessive outpouring of fluid into the intestinal lumen
3.	canned foods and ingestion of unpasteurized honey?		Infection by which of the following organisms is associated with home
a.	Bacillus cereus	c.	Staphylococcus aureus
b.	Clostridium botulinum	d.	Clostridium perfringens
4.	which of the following?		Food poisoning caused by Bacillus cereus is associated with ingestion of
a.	Rewarmed fried rice	c.	Smoked fish
b.	Shellfish	d.	Meat, custards, salads

5. Which of the following hepatitis viruses can cause chronic infection?	
a. Hepatitis A virus	d. b and c only
b. Hepatitis B virus	e. a, b, and c
c.	

5.	Hepatitis C virus	Which of the following hepatitis viruses can cause chronic infection?
6.	Which of the following gastroenteritis in nursing homes?	viruses is associated with outbreaks of
	a. Adenovirus	c. Rotavirus
	b. Norwalk virus	d. Saporovirus
7.	administration of vaccine against hepatitis B virus?	Infection with which of the following hepatitis viruses can be prevented by
	a. Hepatitis A virus	c. Hepatitis D virus
	b. Hepatitis C virus	d. Hepatitis E virus
8.	except:	The following are lactose-fermenting members of the Enterobacteriaceae,
	a. Escherichia coli	c. Klebsiella sp.
	b. Enterobacter sp.	d. Salmonella sp.
9.	shortest incubation period?	Which of the following causes of invasive bacterial diarrhea has the
	a. Yersinia enterocolitica	c. Salmonella typhi
	b. Shigella dysenteriae	d. Escherichia coli
10.	with which of the following organisms?	Hemolytic uremic syndrome is a complication associated with infection
	a. ETEC, Shigella	c. STEC, Shigella
	b. EIEC, Salmonella	d. STEC, Salmonella

	Organism	Disease
Bacterial	Neisseria gonorrhoea	Gonorrhoea
	Haemophilus ducreyi	Chancroid
	Treponema pallidum	Syphilis
	Chlamydia trachomatis	Lymphogranuloma venereum
Viral	HIV	AIDS
	Herpes simplex virus	Genital/Perianal herpes
	Human papillomavirus	Condylomata acuminata
	Hepatitis viruses	Hepatitis
	Zika virus	Zika fever

Fungal	Candida albicans Organism	Vulvovaginal Candidiasis Disease
Protozoal	Trichomonas vaginalis	Trichomoniasis
Parasitic	Phthirus pubis	Pediculosis pubis

	Primary Syphilis	Genital Herpes	Chancroid
Etiologic agent	Treponema pallidum	Herpes Simplex Virus	Haemophilus ducreyi
Incubation period	10–90 days	2–7 days	3–5 days
Usual clinical presentation	Slightly tender papule that ulcerates over 1 to several weeks	Marked pain in genital area; papules ulcerate in 3–6 days; fever, headache, malaise and inguinal adenopathy common	Tender papule that ulcerates
Diagnostic tests	Dark-field exam of exudate from chancre; serologic tests	Virus culture of cells and fluid from chancre; nucleic acid amplification tests	Culture in at least two kinds of enriched media with vancomycin
Long-term sequelae	Secondary syphilis with mucocutaneous lesions; tertiary syphilis	Recurrent genital herpes	Inguinal bubo
Treatment	Benzathine penicillin G; doxycycline if allergic to penicillin	Acyclovir, famciclovir, or valacyclovir	Ceftriaxone, azithromycin, erythromycin, or ciprofloxacin

Name:		Score:
Section:		Date:
	questions. Write the letter of the correct answer on the space provided.	CASE ANALYSIS. Read and analyze the case study, then answer the following
	hospitality worker upon his return from his stint abroad.	Case: A 32-year-old seaman consulted a local hospital because of painful urination and a purulent penile discharge, which started several days after engaging in casual sex with a
1.	The patient is most likely suffering from which of the following?	
	a. Gonorrhea	
	b. Lymphogranuloma venereum	
	c. Genital herpes	
	d. Syphilis	
2.	Which of the following is true of the disease and its etiologic agent?	
	a.	It is the most common sexually transmitted infection worldwide.
	b.	It is caused by a gram-positive kidney-bean shaped diplococcus.
	c. Women usually present with symptoms.	

Name:	d.	Score:	The organism can be grown in selective media such as chocolate agar.
3.			Which of the following is a clinical presentation associated with disseminated infection with the causative agent involved in the case?
	a. Pelvic inflammatory disease	c. Migratory arthralgia	
	b. Ophthalmia neonatorum	d. Urethritis	
4.	wart-like lesions around the genitalia and perianal areas?		Infection with which of the following is associated with development of
	a. Haemophilus ducreyi	c. Herpes simplex virus type 1	
	b. Human papillomavirus	d. Neisseria gonorrhoeae	
5.	infection?	Which of the following organisms is associated with congenital or neonatal	
	a. Treponema pallidum	d.	a and b only
	b. Herpes simplex virus	e.	a, b, and c
	c. Neisseria gonorrhoeae		
6.	development of genital warts?		Which of the following HPV serotypes is most commonly associated with
	a. Serotypes 1, 2, 3, and 4	c.	Serotypes 6 and 11
	b. Serotypes 16 and 18	d.	b and c only
7.	virus?		Which of the following is correct regarding the human immunodeficiency
	a. It is a DNA virus that has tropism for CD8+ T cells.		
	b. It belongs to the family Retroviridae.		
	c. infected cells.		It has the enzyme reverse transcriptase responsible for destroying
	d.		Opportunistic infections are seen during the early stages of the disease.
8.	recurrences of manifestations?		Infection with which of the following is characterized by latency and
	a. Herpes simplex virus	c.	Neisseria gonorrhoeae
	b. Human papillomavirus	d.	Haemophilus ducreyi
9.	following?		Development of inguinal buboes is seen in infection with which of the
	a. Treponema pallidum	c.	Haemophilus ducreyi
	b. Herpes simplex virus	d.	Neisseria gonorrhoeae
10.	of the following?		Malignant transformation of infected cells can occur in infection with which
	a. Herpes simplex virus		

5.	b. infection?	Human immunodeficiency virus	Which of the following organisms is associated with congenital or neonatal
	c.	Haemophilus ducreyi	
	d.	Human papillomavirus	

Clinical Condition	Characteristic Symptoms
Lower Urinary Tract Infection	
Urethritis	Dysuria, frequency, urgency
Cystitis	Suprapubic pain and tenderness, frequency, occasional hematuria
Urethrocystitis	May be asymptomatic; usually malodorous urine, especially in women; incontinence
Upper Urinary Tract Infection	
Acute Pyelonephritis	Flank pain, fever, and chills; hematuria; (+) kidney punch

Name:	Score:
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Section:	Date:
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questions. Write the letter of the correct answer on the space provided.

CASE ANALYSIS. Read and analyze the case study, then answer the following

nor flank pain.

Case: A 26-year-old sexually active female consulted a physician because of increased frequency of urination and burning sensation at the end of urination. There is no fever

1. predispose to development of UTI?

Which of the following predisposing factors present in the patient can

- | | | | |
|----|-----------------|----|--------------|
| a. | Female gender | d. | a and c only |
| b. | Age of patient | e. | a, b, and c |
| c. | Sexual activity | | |

2. reasons?

UTI is more common among females because of which of the following

- | | |
|----|---|
| a. | Women have longer urethra than males. |
| b. | Anatomic variations are more commonly encountered in females. |

c. opening than in males.

The urethral orifice in women is closer in proximity to the anal

- | | |
|----|------------------|
| d. | All of the above |
|----|------------------|

3. with nosocomial infections that produces a distinctive red pigment?

Which of the following is a gram-negative bacillus commonly associated

- | | | | |
|----|-----------------------|----|------------------------------|
| a. | Enterococcus faecalis | c. | Staphylococcus saprophyticus |
| b. | Serratia marcescens | d. | Proteus mirabilis |

4. If urine culture was done for the above given case and the colony count is 97,000 cfu/hpf, what will be your interpretation?

The result is insignificant and just shows contamination of the

4.	a. specimen. If urine culture was done for the above given case and the colony count is 97,000 cfu/hpf, what will be your interpretation?			
	b. There is probable infection and there is need to repeat the procedure.			
	c. There is significant bacteriuria, and patient definitely has UTI.			
	d. None of the above			
5.	Which virus can cause UTI?			
	a. Adenovirus type 2	c.	Herpes simplex type 2	
	b. Human papillomavirus	d.	Norwalk virus	
6.	A patient presenting with fever and chills, flank pain with a (+) kidney punch should be worked up for the presence of which of the following infections?			
	a. Urethritis	c.	Urethrocystitis	
	b. Cystitis	d.	Pyelonephritis	
7.	Which type of Escherichia coli is most commonly associated with UTI?			
	a. ETEC	c.	EAEC	
	b. EIEC	d.	EPEC	
8.	The presence of which among the following in urine is highly suggestive of acute pyelonephritis?			
	a. Numerous WBC	c.	Numerous RBC	
	b. WBC casts	d.	RBC cast	
9.	Cystitis is inflammation involving which of the following?			
	a. Urinary bladder	c.	Urethra	
	b. Renal tubules	d.	Renal glomerulus	
10.	Which of the following organisms is the most common cause of UTI?			
	a. Klebsiella pneumoniae	c.	Escherichia coli	
	b. Staphylococcus saprophyticus	d.	Proteus mirabilis	

Name:	Score:
Section:	Date:
	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.
1.	Acute hemorrhagic conjunctivitis is caused by which of the following?
	a. Herpes simplex virus
	b. Enterovirus 71
	c. Coxsackie A24
	d. Adenovirus
2.	Which of the following is a feature of adenovirus?
	a. It has a double-stranded RNA genome.

Name:	b. It possesses fibers that function for attachment.	Score:
	c. Adenoviruses are susceptible to mild chlorination.	
	d. keratoconjunctivitis.	Serotypes 3 and 7 are the most common causes of epidemic
3.	due to adenovirus?	Which of the following is correct regarding epidemic keratoconjunctivitis
	a. The most common causes are serotypes 8, 19, and 23.	
	b. pools.	The most common source of infection is unchlorinated swimming
	c. Corneal ulcerations are commonly seen.	
	d. It is the most common cause of blindness.	
4.	trachomatis?	Inclusion conjunctivitis is associated with which serotypes of Chlamydia
	a. L1, L2, and L3	c. D – K
	b. A, B, Ba, and C	d. None of these
5.	transmitted by gnats?	Which of the following produces a purulent conjunctivitis that may be
	a. Chlamydia trachomatis	c. Staphylococcus aureus
	b. Haemophilus aegypticus	d. Neisseria gonorrhoeae
6.	birth canal?	Which of the following can be transmitted by passage through an infected
	a. Chlamydia trachomatis	c. Staphylococcus aureus
	b. Haemophilus aegypticus	d. Neisseria gonorrhoeae
7.	pigment and a characteristic fruity or grape-like odor in culture?	Which of the following is an opportunistic pathogen that produces a bluish
	a. Staphylococcus aureus	c. Chlamydia trachomatis
	b. Pseudomonas aeruginosa	d. Streptococcus pneumoniae
8.	following?	Trachoma is a chronic eye infection that presents with which of the
	a. Follicular conjunctivitis	c. Purulent conjunctivitis
	b. Mucopurulent eye discharge	d. Sub-epithelial corneal opacities
9.	Which of the following is a feature of viral conjunctivitis?	
	a. Highly contagious	c. Prominent photophobia
	b. Purulent eye discharge	d. a, b, and c
10.	ulcers?	Which of the following may present with dendritic keratitis and corneal

5.	a.	Measles virus transmitted by gnats?	c.	Which of the following produces a purulent conjunctivitis that may be
	b.	Herpes simplex virus		

	Normal	Bacterial	Viral	Fungal
Appearance	Watery and clear	Turbid	Clear	Slightly turbid
Predominant cell types	All lymphocytes	Usually PMNs	Lymphocytes; may be mixed with PMNs during first 24-48 hours	Usually lymphocytes
Glucose	2.5–3.5 mmol/L (50% of blood glucose)	< 50% of blood glucose; may be markedly low	Usually normal	< 50% of blood glucose; may be markedly low
Protein (g/L)	< 40 mg/dL	Elevated	Elevated	Elevated
WBC	0–5 (all mononuclear)	Markedly increased	Normal to slightly increased	Elevated

Enteroviruses	Tick-borne virus
Poliovirus	Powassan virus
Coxsackievirus	Others
Herpesviruses	Measles virus
HSV type 1 and type 2	Rubella virus
Epstein-Barr Virus	Mumps virus
Varicella Zoster Virus	Rabies virus
Mosquito-borne viruses	
Togaviruses	
Flaviviruses	

	Tuberculoid Form (neural form)	Lepromatous Form (cutaneous form)
Skin Lesions	Hypopigmented lesions	Nodular lesions (diffuse)
Amount of bacilli in lesions	Paucibacillary (very few)	Multibacillary (abundant)
Immune response	Strong CMI reaction	Strong antibody response; defective CMI
Sensory loss	Complete	Patchy
Disfigurement	None	Leonine facies, clawed hands, saddle nose deformity
	Tuberculoid Form (neural form)	Lepromatous Form (cutaneous form)
Lepromin test	Positive	Negative
Infectivity	Low	High

Erythema nodosum leprosum	Tuberculoid Form (neural form) Absent	Lepromatous Form (cutaneous form) Usually present
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Category of Exposure		Management	
	Category I	1.	Wash exposed skin immediately with soap and water.
1. 2.	Feeding/touching the animal Licking of intact skin (with reliable history and thorough physical examination)	2. 3.	Pre-exposure prophylaxis may be considered
3.	Exposure to patient with signs and symptoms of rabies by sharing or eating and drinking utensils		for high-risk persons.
4.	Casual contact (talking to, visiting, and feeding suspected rabies cases) and routine delivery of health care to patient with signs and symptoms of rabies		

Category of Exposure		Management	
	Category II	1.	Wash wound with soap and water.
1.	Nibbling of uncovered skin with or without bruising/hematoma	2.	Start vaccine immediately.
2.	Minor/superficial scratches/abrasions without bleeding, including those induced to bleed.	3.	Complete vaccination regimen until Day 7 regardless of status of biting animal.
	Category III	4.	RIG is not indicated.
1.	Transdermal bites (puncture wounds, lacerations, avulsions) or scratches/abrasions with spontaneous bleeding	1.	Wash wound with soap and water.
		2.	Start the vaccine and RIG immediately.
2.	Licks on broken skin or mucous membrane	3.	Complete vaccination until Day 7 regardless of the status of the biting animal.
3.	Exposure to a rabies patient through bites, contamination of mucous membranes (eyes, oral/nasal mucosa, genital/anal mucous membrane) or open skin lesions with body fluids through splattering and mouth-to-mouth resuscitation		
4.	Unprotected handling of infected carcass		
5.	Ingestion of raw infected meat		
6.	Exposure to bats		
7.	All Category II exposures on head and neck area		

Disease	Etiology	Vector
Japanese B encephalitis	Flavivirus	Aedes mosquito
Eastern Equine encephalitis	Togavirus	Culiseta mosquito
Western Equine encephalitis	Togavirus	Culex mosquito

Disease	Etiology	Vector
St. Louis encephalitis	Flavivirus	Culex mosquito
California encephalitis	Bunyavirus	Culex mosquito

Name:	Score:
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Section:	Date:
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questions. Write the letter of the correct answer on the space provided.
neck rigidity. There is no history of immunization.

CASE ANALYSIS. Read and analyze the case study, then answer the following
Case: A 10-year-old child was rushed to the ER because of drowsiness and confusion. The condition started as high-grade fever, severe headache, nausea, and vomiting. Later, the child was noted to be drowsy and confused. Physical examination was significant for

1. Which of the following tests will you recommend?

- a. Gram stain of respiratory secretions
- b. MRI of the brain
- c. CSF analysis
- d. All of the above

2. what would you entertain?

If examination of the patient's cerebrospinal fluid showed elevated white blood cells, markedly decreased glucose and markedly elevated protein,

- a. Bacterial meningitis
- b. Viral meningitis
- c. Fungal meningitis
- d. Tuberculous meningitis

3. based on the child's age?

Which of the following is the most likely cause of the patient's condition

- a. Escherichia coli
- b. Haemophilus influenzae type b
- c. Neisseria meningitidis
- d. Listeria monocytogenes

4. which of the following organisms causing bacterial meningitis? Waterhouse-Friderichsen syndrome is a consequence of dissemination of

- a. Escherichia coli
- b. Haemophilus influenzae type b
- c. Neisseria meningitidis
- d. Streptococcus agalactiae

5. Which of the following is a feature of Listeria monocytogenes?

- a. Gram-positive cocci
- b.

4.	Cold-loving which of the following organisms causing bacterial meningitis? c. Infects immunocompetent individuals	Waterhouse-Friderichsen syndrome is a consequence of dissemination of
	d. Growth in increased CO ₂	concentration
6.	lepomatous leprosy?	Which of the following is more a feature of tuberculoid leprosy than
	a. Intact cell-mediated immunity	
	b. Saddle nose deformity	
	c. Numerous bacilli in lesions	
	d. Negative lepromin skin test	
7.		Flaccid paralysis is a feature of infection caused by which of the following?
	a. Clostridium botulinum	c. Mycobacterium leprae
	b. Poliovirus	d. a and b only
8.		Which form of poliomyelitis involves the respiratory center in the medulla?
	a. Asymptomatic infection	c. Non-paralytic poliomyelitis
	b. Bulbar poliomyelitis	d. Post-poliomyelitis syndrome
9.	category of rabies exposure?	Administration of rabies vaccine and RIG is recommended for which
	a. Category I	c. Category III
	b. Category II	d. Categories II and III
10.	encephalitis?	Infection with which of the following viral causes does not cause
	a. Japanese B encephalitis	c. Eastern equine encephalitis
	b. Yellow fever	d. St. Louis encephalitis

Features	Rubeola	Rubella
Common name	Measles	German measles
Etiology	Paramyxovirus	Togavirus
Mode/s of transmission	Inhalation of droplets	Inhalation, transplacental
Fever	Present	Present
3 Cs (coryza, cough, conjunctivitis)	Present; conjunctivitis with photophobia	Cough and coryza absent; conjunctivitis without photophobia

Exanthem Features	Maculopapular Rubeola	Maculopapular Rubella
Branny desquamation	Yes	No
Lymphadenopathy	None	Present
Arthralgia	None	Present
Congenital infection	No	Yes
Vaccine	Yes	Yes

Features	Varicella	Variola
Common name	Chickenpox	Smallpox
Mode of transmission	Inhalation, direct contact	Inhalation, direct contact
Exanthem	Vesicular	Vesicular
Eruption of lesions	Crops of different stages	Lesions appear one stage at a time
Scar formation	Rare	Common
Latency	Yes	No
Severity	Children: mild, self-limited Adults: severe	Generally severe and fatal
Vaccine	Yes	Yes

Name:		Score:		
Section:		Date:		
	questions. Write the letter of the correct answer on the space provided.			CASE ANALYSIS. Read and analyze the case study, then answer the following
	only on one side of her trunk, which were very painful, hence the consult.			Case: A 53-year-old female sought consult with her primary care physician due to appearance of painful, vesicular rashes on her trunk. The condition started 3 days prior to consult as low-grade fever and headache. Later, she noted tingling sensation on one area of her trunk. One day prior to consultation, fluid-filled rashes appeared limited
	Physical examination: Temp: 38 °C		RR: 18/minute	PR: 90 beats/minute
Skin:	distribution			(+) vesicular rashes on right side of trunk following a single dermatomal
	Chest and Lungs: wheezes.			No intercostal or subcostal retractions on inspection. On auscultation, there are no rales heard on both lung fields. No
	The rest of the physical examination findings were unremarkable.			
1.	Which of the following will be your primary consideration?			
	a. Chickenpox	c.	German measles	
	b. Shingles	d.		Herpes simplex infection

Name: _____		Score _____	
2. patient's infection?		Which of the following is not a feature of the causative agent of the	
a.	Enveloped DNA virus		
b.	Infects mucoepithelial cells		
c.	Establish latency in nerve ganglia		
d.	No vaccine available against the virus		
3. Which of the following is a feature that will differentiate the patient's condition from the primary infection (chickenpox)?			
		Rashes are generalized.	
a.			
b.	Pain is a prominent feature.		
c.	Rashes appear one stage at a time.		
d.	It is caused by a double-stranded RNA virus.		
4. Which of the following is also known as "sixth disease"?			
a.	Rubeola	c.	Roseola infantum
b.	Rubella	d.	Erythema infectiosum
5. associated with development of congenital infection in the baby?		Infection with which of the following viruses during pregnancy is	
a.	Rubella	c.	Roseola infantum
b.	Rubeola	d.	Erythema infectiosum
6. rubeola?		Which of the following clinical features is seen in rubella but not in	
a.	Post-auricular lymphadenopathy		
b.	Cough and coryza		
c.	Koplik's spots		
d.	Branny desquamation of rashes		
7. The following present with maculopapular rashes, except:			
a.	Rubeola	c.	Rubella
b.	Smallpox	d.	Roseola infantum
8. "Slapped cheek" appearance is associated with which of the following?			
a.	Erythema infectiosum	c.	Roseola infantum
b.	Varicella	d.	Rubeola

9. 3.	Which of the following is a feature that will differentiate the patient's condition from the primary infection (chickenpox)?			
	a.	Rubella virus	c.	Parvovirus B19
	b.	Rubella virus	d.	Varicella-zoster virus
10.	Which of the following has been eradicated due to success of the vaccine?			
	a.	Chickenpox	c.	Rubella
	b.	Parvovirus B19	d.	Smallpox

Features	Dengue Fever	Chikungunya
Etiology Dengue Virus - Flavivirus		Alphavirus - Flavivirus
Vector	Aedes aegypti (rural)	Aedes aegypti (rural)
	Aedes albopictus (urban)	Aedes albopictus (urban)
Incubation Period	2–7 days	2–4 days
Age Group	All ages	All ages
% Symptomatic	20–60%	70%
Symptoms		
Fever	Present	Present
Headache	Severe	Mild
Rash	Present	Present
Retroorbital pain	Present	Absent
Joint pain	Present	More severe
Sequelae	DHF or DSS	Crippling arthritis
Vaccine	Yes	None

Features	Mononucleosis-like Syndrome (CMV)	Infectious Mononucleosis (EBV)
Etiology	Cytomegalovirus	Epstein-Barr Virus
Mode of transmission	Oral secretions	Oral secretions
Fever + lymphadenopathy	Present but milder	Present
Sore throat	Present but milder	Present
Hepatosplenomegaly	Present	Present
Lymphocytosis	Present	Present
Atypical lymphocytes	Present	Present
Heterophil antibody test	Negative	Positive

Disease	Etiology	Vector

Rocky Mountain Spotted Fever Disease	Rickettsia rickettsii Etiology	Tick Vector
Rickettsialpox	Rickettsia akari	Mite
Epidemic typhus	Rickettsia prowazekii	Louse
Murine typhus	Rickettsia typhi	Flea
Scrub typhus	Orientia tsutsugamushi	Mite
Ehrlichiosis Human monocyte ehrlichiosis Human granulocyte ehrlichiosis Ewingii ehrlichiosis	Ehrlichia chaffeensis Anaplasma phagocytophilum Ehrlichia ewingii	Tick Tick Tick
Q fever	Coxiella burnetii	None

Disease	Organism	Vector	Reservoir
Rocky Mountain spotted fever	R. rickettsii	Tick-borne	Ticks, wild rodents
Ehrlichiosis	E. chaffeensis		Ticks
Rickettsialpox	R. akari	Mite-borne	Mites, wild rodents
Scrub typhus	R. tsutsugamushi		Mites (chiggers), wild rodents
Epidemic typhus	R. prowazekii	Louse-borne	Humans, squirrel fleas, flying squirrels
Trench fever	R. quintana		Humans
Murine typhus	R. typhi	Flea-borne	Wild rodents
Q fever	C. burnetii	None*	Cattle, sheep, goats, cats

Name:		Score:	
Section:			Date:
	questions. Write the letter of the correct answer on the space provided.		CASE ANALYSIS. Read and analyze the case study, then answer the following Case: A 7-year-old boy was brought to the ER because of nose bleeding and vomiting of blood. The patient was apparently well until 4 days prior to admission when the
	mosquitoes while playing with friends prior to development of the symptoms.		patient developed moderate-grade fever, headache, and muscle pains over the lower extremities. Two days prior to admission, the maculopapular rashes were noted over the trunk and extremities. Few minutes prior to admission, the patient had epistaxis and two bouts of hematemesis. The mother reported that he had a history of being bitten by
1.	Which of the following infections would be the primary consideration?		
	a. Chikungunya	c.	Zika virus infection
	b. Dengue	d.	Nipah virus infection
2.	condition?		Which of the following is the vector of the pathogen causing the patient's
	a. Anopheles flavirostris	c.	Aedes aegypti

Name:	b. Culex sp.	d. Mansonia sp.	Score:
3.	it would be categorized as which of the following?		Based on the clinical presentation, if the patient has dengue virus infection,
	a. Classic Dengue Fever	c. Dengue Shock Syndrome	
	b. Dengue Hemorrhagic Fever	d. None of them	
4.	infection and not in chikungunya?		Which of the following clinical manifestations is seen in dengue virus
	a. Fever	c. Joint pain	
	b. Rash	d. Retroorbital pain	
5.	Which of the following is not true of cytomegalovirus?		
	a.	Most common viral cause of congenital infections	
	b.	Can be transmitted through tissue transplantation	
	c.	Causes latent infection in B cells	
	d.	Causes enlargement of infected cells	
6.	infected patients is suggestive of infection with which of the following?		Demonstration of atypical T lymphocytes in hematologic examination of
	a.	Epstein-Barr virus	c. Cytomegalovirus
	b.	Zika virus	d. Chikungunya virus
7.			Which of the following is transmitted by the bite of the human body louse?
	a.	Rickettsia prowazekii	c. Orientia tsutsugamushi
	b.	Rickettsia rickettsii	d. Rickettsia typhi
8.	Brill-Zinsser disease is a recrudescent infection seen in which of the following?		
	a.	Rickettsialpox	c. Epidemic typhus
	b.	Endemic typhus	d. Scrub typhus
9.	Weil's disease or infective jaundice is associated with infection caused by which of the following?		
	a.	Borrelia burgdorferi	c. Leptospira interrogans
	b.	Ehrlichia chaffeensis	d. Coxiella burnetti
10.	Which of the following is true of Nipah virus?		
	a.	It belongs to the family Herpesviridae.	
		The infection produced has a short	

5.	b.	incubation period (1-5 days).				
	c.	Which of the following is not true of cytomegalovirus?				
		Its natural reservoir is the fruit bat.				
	d.	Infection produced is mild and self-limiting.				

Name: Score:

Section: Date:

Column A	
1.	Mirror or illuminator
2.	Condenser
3.	Diaphragm
4.	Coarse adjustment knob
5.	Fine adjustment knob
6.	Eye piece
7.	Objective lenses
8.	Low-power objective
9.	High-power objective
10.	Oil immersion

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

1.	Which of the following is correct regarding the electron microscope?
	a. It utilizes transmitted light as the source of illumination.
	b. It can magnify an object up to 1,000 times its size.
	c. Objectives are used to focus the beam of light to the object.
	d. It is used to visualize viruses and the subcellular structures of a cell.
2.	Which type of microscope is used to study molecular and atomic shapes of an organism on a nanoscale and determine variations in temperature inside the cell?
	a. Electron microscope
	c. Confocal microscope
	b. Scanning probe microscope
	d. Phase-contrast microscope
3.	Which of the following types of microscopes is useful in studying the physiology of the cell?

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

b.
Brightfield microscope

c.
Interference contrast microscope

d.
Fluorescence microscope

4. Which of the following statements is correct regarding the darkfield microscope?

a.
It is used to demonstrate viruses.

b.
It utilizes transmitted light.

c.
The specimen appears bright against a dark background.

d.
It has a contrast-enhancing optical technique.

5. Which of the following types of microscopes makes use of ultraviolet light and fluorescent dyes?

a.
Phase-contrast microscope

b.
Fluorescence microscope

c.
Interference contrast microscope

d.
Compound microscope

Name: Score:

Section: Date:

Features	Eukaryotic Cell	Prokaryotic Cell
Nucleus enclosed by nuclear membrane		
Larger ribosome		
Membrane-bound organelles		
Complex cell wall		
Mostly unicellular		

Characteristic	Bacteria	Fungi	Viruses	Protozoa	Algae
Acellular					
Ergosterol in the cell membrane					
Prokaryotic					

Obligate intracellular parasite	Bacteria	Fungi	Viruses	Protozoa	Algae
Exist as cyst and/or trophozoite					
Dinoflagellates					

Name: Score:

Section: Date:

B. Indicate the function of the different reagents used in Gram staining given in the

table below, and the expected result. Write the letter/number corresponding to

your answer.

Reagent	Function	Expected Result	
		Gram-positive	Gram-negative
Crystal violet			
Gram's iodine			
95% Alcohol			
Safranin			

Features	Gram-positive Cell Wall	Gram-negative Cell Wall
Multilayered peptidoglycan		
Porins (protein channels)		
Teichoic acid		
Lipopolysaccharide complexes		
Outer membrane		

Name: Score:

Section: Date:

B. Differentiate between the two methods of acid-fast staining by filling out the table

below with the letter/number corresponding to your answer.

EXPECTED RESULT				
REAGENT	FUNCTION	Ziehl-Neelsen	Kinyoun	
Carbolfuchsin				
Acid alcohol				
Safranin				

C.
MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

Name: Score:

Section: Date:

		Growth Obtained	
Exposure to Heat	Bacillus subtilis	Escherichia coli	
Autoclave at 15 psi for 15 minutes			
Boiling water for 30 minutes			
Heating at 60 °C for 1 hour			

Chemical Agent	Growth Observed
Control	
1:1000 Zephiran	
70% alcohol	
Providone-iodine	

- It is a method of sterilization that involves the physical separation of microorganisms from the fluid.
- This method is utilized to deprive the organisms of moisture.
- This method is used to destroy disease-causing microorganisms in milk, milk products, food, and beverages.
- At 15 psi, the temperature reaches 121°C, requiring only 15–20 minutes to sterilize the material.
- The material to be sterilized is exposed to live steam for 30 minutes for 3 consecutive days.
- This chemical agent is used as a standard for evaluating new chemical agents.
- This chemical agent is used as water disinfectant.
- This chemical agent is a phenol derivative that is less toxic and more potent than phenol.
- It is considered the best antiseptic.
- It is used as prophylaxis for ophthalmia neonatorum.

Name: Score:

Section: Date:

1.	Lophotrichous	Peritrichous
	Amphitrichous	Monotrichous

2.	Lophotrichous	Peritrichous
1.	Lophotrichous	Peritrichous
	Amphitrichous	Monotrichous
3.	Lophotrichous	Peritrichous
	Amphitrichous	Monotrichous
4.	Lophotrichous	Peritrichous
	Amphitrichous	Monotrichous

Column A	Column B
1.	a.
Cell wall	Adherence and conjugation
2.	b.
Cell membrane	Protein synthesis
3.	c.
Lipopolysaccharide (LPS)	For storage of food and energy
4.	d.
Ribosomes	Resistance to adverse
5. Nucleoid	environmental conditions
6.	e.
Granules	Motility
7.	f.
Pili	Resistance to phagocytosis
8.	g.
Flagella	Endotoxin activity
9.	h.
Endospores	Gives form and rigidity to the cell
10.	i.
Capsule	Site of ATP production
	j. Contains the genetic material of the bacteria

Name:	Score:
Section:	Date:

Antibiotic	Zone Size	Interpretation*

Both a and b
MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

b.
 Test tube method
 d.
 Neither a nor b

4. Which of the following mechanisms is responsible for resistance to antibiotics?

a.
 Lack of enzymes that would accelerate antibiotic metabolism

b.
 Production of proteins with similar structure as the antibiotic

c.
 Development of efflux pumps that prevent accumulation of the antibiotic

d.
 Expression of resistance genes that will cause accumulation of the antibiotic in the host

5. Which of the following combinations of antibiotic and mechanism of action is correct?

a.
 Cell wall inhibition – Penicillin

b.
 Cell membrane alteration – Vancomycin

c.
 Protein synthesis inhibition – Nystatin

Name: Score:

Section: Date:

A.
MATCHING TYPE. Write the letter of the correct answer on the space provided.

I. Match the stage of infection (Column A) with the corresponding events

occurring during each stage (Column B).

Column A	Column B
1. Incubation period	a. Signs and symptoms of the
2. Prodromal period	patient start to decline
3. Period of illness	b. Period of maximal invasion
4. Period of defervescence	c. Recovery period
5. Period of convalescence	d. Early but mild symptoms; usually non-specific manifestations
	e.

Column A	From entry of pathogen to appearance of initial manifestations	Column B
Column A	Column B	
1. Carrier	a.	Insects that transmit infection
2. Fomite	b.	Presence of bacteria in the blood
3. Vector	c.	Person harboring the organism
4. Vehicle		without signs and symptoms of
5. Septicemia		the disease
6. Fulminant infection	d.	Hospital-acquired infections
7. Nosocomial infection	e.	A disease constantly present in a population at low levels
8. Endemic disease	f.	Inanimate object which can carry
9. Bacteremia		microorganisms
10. Viremia	g.	Multiplying bacteria in the bloodstream
	h.	Biological substances that can carry organisms
	i.	Presence of viruses in the bloodstream
	j.	Infection that always leads to death

Feature	Exotoxin	Endotoxin
Bacterial source		
Toxicity		
Stability to heat		
Antigenicity		
Fever production		

A. Fill out the following tables.

--- -- - ----- --

Property	Innate Immunity	Adaptive immunity
Activity at birth		
Response time		
Specificity for microorganisms		
Cells involved		

Immunological memory Property	Innate Immunity	Adaptive immunity
Hypersensitivity Reaction	Descriptive name	Mediator(s) Example(s)
Type I		
Type II		
Type III		
Type IV		

Column A	Column B
1. IgG	a. Indicative of allergic reactions and parasitic
2. IgM	infections
3. IgA	b. Serves as surface markers for B cells
4. IgE	c. Found in body secretions like the saliva and tears
5. IgD	d. Predominant antibody during chronic infections
	e. Predominant antibody during acute infections

Column A	Column B
1. Bone marrow	a. Primary lymphoid organ
2. Spleen	b. Secondary lymphoid organ
3. Appendix	
4. Thymus	
5. Mucosa-associated lymphoid tissues	

Name: Score:

Section: Date:

A. Match the protozoans in Column A with their respective vectors in Column B.

	Column A		Column B
1.	Trypanosoma cruzi	a.	Phlebotomus and Lutzomyia fly (sandfly)
2.	Trypanosoma brucei	b.	Anopheles mosquito
3.	Leishmania sp.	c.	Triatomine/reduviid bug

A.		Plasmodium spp. Match the protozoans in Column A with their respective vectors in Column B.	d.	Glossina/tsetse fly
B.	(Column A).	Match the Plasmodium species (Column B) with their respective characteristics Column A		Column B
	1.	Natural parasite of macaque monkeys		a. Plasmodium ovale
	2.	Infects both young and old RBCs		b. Plasmodium vivax
	3.	Cycle of fever every 72 hours		c. Plasmodium malariae
	4.	Malignant tertian malaria		d. Plasmodium falciparum
	5.	Maurer's dots		e. Plasmodium knowlesi
	6.	Schuffner's dots		f. d and e only
	7.	Infects old red blood cells		g. a and b only

Column A	Column B
1. Entamoeba histolytica	a. Bite of arthropod vector
2. Naegleria fowleri	b. Ingestion of contaminated food or water
3. Acanthamoeba sp.	c. Sexual contact
4. Giardia lamblia	d. Transnasal
5. Trichomonas vaginalis	e. Transplacental
6. Toxoplasma gondii	f. b and e only
7. Plasmodium sp.	
8. Leishmania donovani	
9. Balantidium coli	
10. Trypanosoma cruzi	

A.		MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.			
1.	Which of the following is correct regarding cestodes?				
	a. The body is divided into segments called strobila.				
	b. All are hermaphroditic.				
	c. The head contains an organ for attachment called rostellum.				
	d. The infective stage is the embryonated egg.				
2.	Hydatid cyst is associated with which of the following cestodes?				
	a. Diphyllbothrium latum	c. Hymenolepis nana			
	b. Echinococcus granulosus	d. Taenia saginata			

A.		Cysticercus cellulosae is the infective stage for which of the following MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.	
3.	parasites?	a. Taenia solium	c. Hymenolepis nana
		b. Echinococcus granulosus	d. Taenia saginata
4.		Which of the following cestodes has two intermediate hosts?	
		a. Diphyllobothrium latum	c. Hymenolepis nana
		b. Echinococcus granulosus	d. Taenia saginata
5.		Which of the following cestodes has no obligatory intermediate host?	
		a. Taenia solium	c. Hymenolepis nana
		Echinococcus granulosus b.	Taenia saginata d.
6.	The following are intestinal cestodes, except:		
		a. Taenia solium	c. Taenia saginata
		b. Hymenolepis nana	d. Echinococcus granulosus
7.		Which of the following is a characteristic of Hymenolepis nana?	
	a.	The freshwater fish is its intermediate host.	
	b.	The infective stage is the cysticercoid larvae.	
	c.	It may be transmitted by direct contact.	
	d.	Infection mimics pinworm infection because of pruritus ani.	
8.	cestodes?	The plerocercoid larva is the infective stage of which of the following	
	a. Taenia solium	c.	Diphyllobothrium latum
	b. Hymenolepis nana	d.	Echinococcus granulosus
9.	solium?	Which of the following differentiates Taenia saginata from Taenia	
	a. Its intermediate host is cattle.		
	b. The scolex contains rostellum.		
	c.	Each proglottid contains about 7-15 uterine branches.	
	d.	Manifests with larva within a cyst.	

10. Which of the following is a characteristic of <i>Hymenolepis nana</i> ?		Humans serve as both definitive and intermediate host for which of the following cestodes?	
a. <i>Taenia saginata</i>		c. <i>Taenia solium</i>	
b. <i>Echinococcus granulosus</i>		d. <i>Diphyllobothrium latum</i>	
B. MATCHING TYPE. Match the following parasites with their common names (Column A) and respective intermediate host (Column B). On the first blank, write the letter of your choice from Column A. On the second blank, write the Roman numeral of your choice from Column B.			
		Column A	Column B
1. <i>Taenia saginata</i>	a.	Broad fish tapeworm	i. Pig
2. <i>Taenia solium</i>	b.	Pork tapeworm	ii. Freshwater fish
3. <i>Hymenolepis nana</i>	c.	Dog tapeworm	iii. Cattle
4. <i>Echinococcus granulosus</i>	d.	Dwarf tapeworm	iv. Sheep

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

1.	penetration?	Which of the following trematodes is acquired through skin
	a. <i>Paragonimus westermani</i>	c. <i>Clonorchis sinensis</i>
	b. <i>Schistosoma haematobium</i>	d. <i>Fasciola hepatica</i>
2.	pulmonary tuberculosis?	Which of the following trematodes cause infection that mimics
	a. <i>Paragonimus westermani</i>	c. <i>Clonorchis sinensis</i>
	b. <i>Schistosoma haematobium</i>	d. <i>Fasciola hepatica</i>
3.	animals act as important reservoirs?	Which of the following is the only schistosome where domestic
	a. <i>Schistosoma mansoni</i>	c. <i>Schistosoma haematobium</i>
	b. <i>Schistosoma japonicum</i>	
4.		Which of the following trematodes can cause obstructive jaundice?
	a. <i>Fasciolopsis buski</i>	c. <i>Schistosoma mansoni</i>
	b. <i>Paragonimus westermani</i>	d. <i>Fasciola hepatica</i>
5.		Which of the following causes a disease that mimics duodenal ulcer?
	a. <i>Fasciolopsis buski</i>	c. <i>Schistosoma mansoni</i>

Paragonimus westermani
b.

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

B. MATCHING TYPE. Match the following parasites in Column A with their common names in Column B.

	Column A		Column B
1.	Fasciolopsis buski	a.	Blood fluke
2.	Paragonimus westermani	b.	Sheep liver fluke
3.	Fasciola hepatica	c.	Lung fluke
4.	Clonorchis sinensis	d.	Intestinal fluke
5.	Schistosoma japonicum	e.	Chinese liver fluke

Parasite	First Intermediate Host	Second Intermediate Host
Schistosoma spp.		
Clonorchis sinensis		
Paragonimus westermani		
Fasciolopsis buski		
Fasciola hepatica		

Parasite	Site of Infection	Associated Complication
Schistosoma		
japonicum		
Schistosoma mansoni		
Schistosoma		
haematobium		

Name: Score:

Section: Date:

MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.

1.	infection?		Which of the following is the most common parasitic intestinal
	a. Trichuriasis	c.	Ascariasis
	b. Trichinosis	d.	Enterobiasis
2.	What is the active feeding form of hookworms?		
	a. Filariform larva	c.	Rhabditiform larva
	b. Fork-tailed cercaria	d.	Metacercaria

3.	Which of the following is a characteristic of <i>Trichuris trichiura</i> ?	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.	
	a. Also known as pinworm		
	b. Resembles a "whip"		
	c. Causes iron deficiency anemia		
	d. Larva is encysted in muscle tissue.		
4.	Which of the following is correct regarding <i>Wuchereria bancrofti</i> ?		
	a. It is the more common cause of elephantiasis.		
	b. The infective stage is metacercaria.		
	c. It is transmitted by bite of ticks.		
	d. Ground itch appears during the invasive stage.		
5.	flat on one side?	Which of the following nematodes produces eggs that are oval and	
	a. <i>Ascaris lumbricoides</i>	c.	<i>Trichinella spiralis</i>
	b. <i>Enterobius vermicularis</i>	d.	<i>Trichuris trichiura</i>

Column A		Column B	
1.	<i>Capillaria philippinensis</i>	a.	Threadworm
2.	<i>Necator americanus</i>	b.	Pinworm
3.	<i>Strongyloides stercoralis</i>	c.	Malayan filarial worm
4.	<i>Enterobius vermicularis</i>	d.	Whipworm
5.	<i>Trichinella spiralis</i>	e.	New World hookworm
6.	<i>Trichuris trichiura</i>	f.	Pudoc worm
7.	<i>Brugia malayi</i>	g.	Muscle worm

Parasite	Mode of Transmission	Characteristic Manifestation	Diagnosis
<i>Ascaris lumbricoides</i>			
<i>Trichuris trichiura</i>			
<i>Enterobius vermicularis</i>			
<i>Strongyloides stercoralis</i>			
<i>Necator americanus</i>			
<i>Capillaria</i>			

philippinensis Parasite Trichinella spiralis	Mode of Transmission	Characteristic Manifestation	Diagnosis
Wuchereria bancrofti			

Name:		Score:
Section:		Date:
		LEARNING OBJECTIVE
in analyzing cases pertaining to skin infections.		At the end of the laboratory period, the student should be able to develop the skills
A.	questions. Write the letter of the correct answer on the space provided.	CASE ANALYSIS. Read and analyze the case studies, then answer the following
	ruptured and formed crusts.	Case No. 1: A 6-year-old boy was brought to a physician because of skin lesions described as having "honey-colored crusts" over the lower extremities. The condition started a week prior to consultation as vesicular lesions which later
	1. What is the most probable diagnosis?	
	a.	Staphylococcal scalded skin syndrome
	b. Erysipelas	
	c. Necrotizing fasciitis	
	d. Impetigo	
	2.	What is the most probable causative agent for this condition?

3. What is the distinctive characteristic of the causative agent?			
a.	Produces water-soluble pigments		
b.	Produces golden yellow colonies		
c.	Strict anaerobe		
d.	Produces endospores		
4.	What diagnostic tests would you request to establish the diagnosis?		
a.	Gram stain	c.	Serology
b.	Culture	d.	Bacitracin test
5.	The causative agent will yield a positive result in which of the following tests?		
a.	Optochin test	c.	Coagulase test
b.	Bacitracin test	d.	Urea test
	Case No. 2: A 15-year-old girl consulted a physician because of hypopigmented macules over her right cheek. On physical examination, the lesions appear scaly and dry, with a "chalky" appearance. There are no other accompanying signs and		

symptoms. Fungal infection is suspected. What is the distinctive characteristic of the causative agent?			
1.	What is the probable diagnosis?		
	a.	Tinea corporis	c. Chromoblastomycosis
	b.	Tinea versicolor	d. Tinea nigra
2.	What is the most likely etiologic agent?		
	a.	Exophiala werneckii	c. Fonseca pedrosoi
	b.	Microsporum canis	d. Malassezia furfur
3.	What is the characteristic microscopic appearance of the causative agent when stained with 10% KOH?		
	a.	"Spaghetti and meatballs"	c. Daisy-like arrangement
	b.	Favic chandelier	d. Teardrop microconidia

Column A		Column B	
1.	Fever blister	a.	Staphylococcus epidermidis
2.	Osteochondritis	b.	Streptococcus pyogenes
3.	Condylomata acuminata	c.	Curvularia sp.
4.	Mycetoma or Madura foot	d.	Human papillomavirus
5.	Rose gardener's disease	e.	Clostridium perfringens
6.	Myonecrosis or Gas gangrene	f.	Exophiala werneckii
7.	Necrotizing fasciitis	g.	Pseudomonas aeruginosa
8.	Stitch abscess	h.	Herpes simplex virus

Name:		Score:	
Section:		Date:	
LEARNING OBJECTIVE			
At the end of the laboratory period, the student should be able to develop the skills in analyzing cases pertaining to infections of the respiratory tract.			
A.	CASE ANALYSIS. Read and analyze the case studies, then answer the following questions. Write the letter of the correct answer on the space provided.		
Case No. 1: A 7-year-old child was brought to the emergency room because of fever and prolonged episode of forceful, dry hacking cough with a distinct inspiratory whoop. The patient has no history of immunization.			
1. What is the most probable diagnosis?			
	a.	Pneumonia	c. Pertussis
	b.	Bronchitis	d. Diphtheria
2. What is the most probable causative agent?			
	a.		

Staphylococcus aureus Name:	c.	Corynebacterium diphtheriae Score:
b. Streptococcus pneumoniae	d.	Bordetella pertussis

4. The patient is in what stage of the disease process?

a. Catarrhal stage	c. Convalescent stage
b. Paroxysmal stage	d. Prodromal stage

5. Which of the following is the best way to prevent this infection?

a. Good hygiene	c. Take vitamin C
b. Drink plenty of water	d. Vaccination

patient had lost weight due to loss of appetite.

Case No. 2: A 35-year-old male construction worker complains of blood-streaked sputum. The condition started 1 month prior to consultation as dry, non-productive cough of 2 weeks' duration associated with afternoon rises in body temperature and night sweats. The wife noticed that since the condition started the

1. What is the most probable diagnosis?

a. Bronchiolitis	c. Pneumonia
b. Pulmonary tuberculosis	d. Pulmonary anthrax

2. What is the most probable causative agent?

a. Adenovirus	c. Mycobacterium tuberculosis
b. Klebsiella pneumoniae	d. Bacillus anthracis

3. Which of the following best characterizes the causative agent?

a. Gram-positive bacilli, encapsulated
b. Acid-fast, obligate aerobic bacilli
c. Facultative gram-negative bacilli
d. Gram-positive bacilli, aerobic spore-former

4. diagnose this infection? Which of the following tests would be the best for you to request to

a. Tuberculin skin test
b. Sputum examination with acid-fast stain
c. Chest X-ray

4. ^{d.} The patient is in what stage of the disease process?
Gram stain

Column A	Column B
1.	a.
Pontiac fever	Respiratory syncytial virus
2.	b.
Walking pneumonia	SARS-CoV-2
3.	c.
Viral pneumonia	Mycoplasma pneumoniae
4.	Legionella pneumophila
COVID-19	d.
5.	e.
Bronchiolitis in infants	Adenovirus

LEARNING OBJECTIVE

DECHOII		Date	
Section:		Date:	
Name:		Score:	

3. Which of the following antigens is responsible for the antiphagocytic characteristic of the causative agent?

	a.	Somatic antigen	c.	Capsular antigen
	b.	Flagellar antigen	d.	a and c only
4.		What is the best specimen to collect at this stage of infection?		
	a.	Urine	c.	Blood
	b.	Stool	d.	Sputum
5.		Which of the following best describes a carrier for this infection?		
	a.	more than 1 year		Asymptomatic carriage of the bacteria in the gallbladder for
	b.	1 year		Asymptomatic carriage of the bacteria in the blood for more than
	c.	6 months		Asymptomatic carriage of the bacteria in the kidneys for
	d.	6 months		Asymptomatic carriage of the bacteria in the gallbladder for
		Case No. 2: A 25-year-old male was brought		

negative. 3.	Which of the following antigens is responsible for the antiphagocytic characteristic of the causative agent?	to the hospital because of fever and yellowish discoloration of the skin and sclerae. On physical examination, the liver is enlarged and tender. Laboratory results reveal (+) HBsAg. Gram stain was		
1.		What is your primary consideration for this case?		
	a.	Salmonellosis	c.	Hemolytic uremic syndrome
	b.	Liver cirrhosis	d.	Viral hepatitis
2.		What is the most likely etiologic agent?		
	a.	Salmonella typhi	c.	Shigella dysenteriae
	b.	Alcoholism	d.	Hepadnavirus
3.		The most likely etiologic agent is transmitted by the following methods, except:		
	a.	Fecal-oral	c.	Sexual contact
	b.	Blood transfusion	d.	Parenteral

Column A		Column B	
1.	Fulminant infection	a.	Hepatitis A virus
2.	Most common cause of post transfusion hepatitis	b.	Hepatitis B virus
		c.	Hepatitis C virus
3.	Vaccine preventable hepatitis	d.	Hepatitis D virus
4.	Occur as co-infection or super infection with HBV	e.	Hepatitis E virus
5.	A DNA virus	f.	b and c only
6.	Can progress to chronicity	g.	b, c, and d only
7.	Can progress to hepatocellular carcinoma	h.	a and b only

Infe		cti	ons
Nan	me:		Score:
Sect	cion:		Date:
	LEARNING OBJEC	TIVE	
	At the end of the laboratory period, the studer nalyzing cases pertaining to infections of the ge		-
A.	CASE ANALYSIS. Read and analyze the casquestions. Write the letter of the correct answ		8
	Case No. 1: A 28-year-old seaman consulted nodule on the shaft of his penis that is hard a enlargement of his inguinal lymph nodes. The smooth edges.	nd pai	nless accompanied by painless
	1. What is the most probable diagn	osis?	
			Granuloma

a. Chancroid Infe	c. cti	inguinale onis
b. Syphilis	d.	Genital herpes
2. What is the most likely etiologic	agent?	
a. Haemophilus ducreyi	C	Chlamydia trachomatis
b. Treponema pallidum	d.	Herpes Simplex type 2
3. Which of the following tests is a	specific	treponemal test?
a. VDRL	-	FTA-ABS
b. Rapid plasma reagin test	d.	Darkfield microscopy

1. Which of the following statements is correct regarding UTI?			
a.	It is more common in males than females.		
b.		Unprotected sexual intercourse can predispose one to UTI.	
c.	Hypertensive individuals are more susceptible to UTI.		
d.	Anatomic abnormalities such as kinking of the pelvis can lead to UTI.		
2. Which of the following is the most common cause of UTI?			
a.	Escherichia coli	c.	Pseudomonas aeruginosa
b.	Staphylococcus aureus	d.	Enterococcus faecalis
3. of renal stones?			
		Which of the following organisms is associated with the development	
a.	Serratia marcescens	c.	Proteus mirabilis
b.	Staphylococcus saprophyticus	d.	Escherichia coli
4. pigment known as prodigiosin?			
		Which of the following organisms produces red colonies due to a	
a.	Pseudomonas aeruginosa	c.	Candida albicans
b.	Serratia marcescens	d.	Proteus mirabilis
5. urethritis?			
		Which of the following is a common cause of non-gonococcal	
a.	Neisseria gonorrhoeae	c.	Staphylococcus saprophyticus
b.	Chlamydia trachomatis	d.	Escherichia coli

Column A	Column B
1. Gummas	a. Primary syphilis
2. Chancre	b. Secondary syphilis

4.	c.	Which of the following are possible modes of transmission of rabies? Most present with inapparent infection	
	d.	Not preventable by vaccination	
3.		infants?	Which of the following is the most common cause of meningitis in
	a.	Escherichia coli	c. Flavivirus
	b.	Haemophilus influenzae	d. Neisseria meningitidis
4.		Flaccid paralysis occurs in the following diseases, except:	
	a.	Infant botulism	c. Poliomyelitis
	b.	Tetanus	d. Rabies

a.	Candida albicans	c.	Cryptococcus neoformans
b.	Histoplasma capsulatum	d.	Coccidioides immitis
I.	Column B	Column A	MATCHING TYPE. Write the letter of the correct answer on the space provided. Match the clinical presentation in Column A with the type of leprosy in Column B
	1. 2.	Highly infectious Complete sensory loss	a. Tuberculoid leprosy b. Lepromatous leprosy
	3.	Present with hypopigmented lesions	c. Both a and b d. Neither a nor b
	4. 5.	Leonine facies Negative lepromin test	
II.			Match each of the items in column A with the causative agent in column B.
		Column A	Column B
	1.	Transmitted by bite of ticks	a. Clostridium botulinum
	2.	Trismus and risus sardonius	b. Chlamydia trachomatis
	3.	Associated with unpasteurized honey	c. Haemophilus ducreyi d. Listeria monocytogenes e. Japanese B encephalitis
	4. 5.	Inhalation of spores from pigeon droppings Ophthalmia neonatorum	virus f. Neisseria meningitidis g. Cryptococcus neoformans
	6. 7.	Cold-loving bacteria Waterhouse-Friderichsen syndrome	h. Adenovirus i. Neisseria gonorrhoeae
	8.	Swimming pool conjunctivitis	j. Clostridium tetani

a.

Candida albicans

c. Cryptococcus neoformans

Name: Score:

Section: Date:

1. What is the most probable diagnosis?

a. German measles

c. Roseola infantum

b. Measles

d. Erythema infectiosum

2. What is the most likely causative agent?

a. Rubella virus

c. Human herpes virus 6

b. Parvovirus B19

d. Rubeola virus

3. What do you call the pathognomonic enanthem associated with this disease?

a. Rose spots

c. Forchheimer spots

b. Koplik's spots

d. Slapped cheek appearance

4. What is the most common complication associated with this infectious disease?

a. Pneumonia

b. Otitis media

c. Subacute sclerosing panencephalitis

d. Crippling arthritis

5. Which of the following exanths is not vaccine-preventable?

a. Measles

c. Rubella

b. Roseola infantum

d. Chickenpox

6. Which of the following exanths present with vesicular lesions?

a. Fifth disease

c. Smallpox

I. Match the clinical presentation in Column A with the condition in Column B.

Column A

Column B

1. Forchheimer spots

a. Measles

2. "Slapped cheek" appearance

b. Fifth disease

I.	3.	Painful vesicles along the dermatome	Match the clinical presentation in Column A with the condition in Column B.	c.	Chickenpox
				d.	Zika
	4.	Totally eradicated by vaccination		e.	Smallpox
				f.	Shingles
	5.	Itchy vesicles in crops in different stages		g.	Rubella
	6.	Crippling arthritis			
	7.	Branny desquamation			
	8.	Post-auricular lymphadenopathy			
	9.	Subacute sclerosing panencephalitis			
	10.	Congenital heart defect			
II.	Match the infection in Column A with the causative agent in Column B.				
	Column A			Column B	
	1.	Measles		a.	Human herpes virus 6
	2.	Erythema infectiosum		b.	Varicella-zoster virus
	3.	Chickenpox		c.	Parvovirus B19
	4.	German measles		d.	Rubella virus
	5.	Roseola infantum		e.	Rubeola virus

Name:
Score:

Section:
Date:

LEARNING OBJECTIVE

At the end of the laboratory period, the student should be able to develop the skills in analyzing cases related to selected systemic infections.

A. CASE ANALYSIS. Read and analyze the case study, then answer the following questions. Write the letter of the correct answer on the space provided.

Case: A 7-year-old boy was brought to the emergency room because of nose bleeding (epistaxis) and vomiting of blood (hematemesis). The patient was apparently well until 7 days prior to admission when the patient developed moderate- to high-grade fever, headache, and muscle pains over the lower extremities. Two days prior to admission, maculopapular rashes were noted over the trunk and extremities. Few minutes prior to admission, the patient had

3. Which of the following is correct regarding this case?

a.
It is caused by a DNA virus.

b.
The vector is *Aedes aegypti*.

c.
It is characterized by atypical lymphocytes.

3.	Which of the following is correct regarding this case? It may present with morbilliform rash.			
4.	The vector of this infection is characterized by which of the following?			
	a. Lays eggs in clear stagnant water			
	b. Capable of long-range flights			
	c. Nocturnal biter			
	d. Male mosquitoes bite			
5.	What are the components hemorrhagic fever?	of	WHO's definition	of dengue
	a. Fever	c.	Thrombocytopenia	
	b. Bleeding	d.	a, b, and c	
B.	MULTIPLE CHOICE. Write the letter of the correct answer on the space provided.			
1.	Which of the following is an arthropod-borne infection?			
	a. Chikungunya	c.	Q fever	
	b. Infectious mononucleosis	d.	Leptospirosis	
2.	Which of the following heterophile antibodies?	produces	atypical	lymphocytes and
	a. Cytomegalovirus	c.	Epstein-Barr Virus	
	b. Leptospira interrogans	d.	Borrelia burgdorferi	
3.	Camel back pattern of fever is a manifestation of which of the following infections?			
	a. Leptospirosis	c.	Lyme disease	
	b. Dengue fever	d.	Infectious mononucleosis	
4.	How can you prevent arthropod-borne infections?			
	a. Destroy breeding places of insects .			
	b. Wear thick clothing.			
	c. Apply insect repellants.			

3. Which of the following is correct regarding this case?

d. All of the above

d. **migrans.**

	Column A		Column B
1.	Chikungunya	a.	Tick
2.	Scrub typhus	b.	Mosquito
3.	Dengue fever	c.	Louse
4.	Infectious mononucleosis	d.	Flea
5.	Relapsing fever	e.	Mite
6.	Rocky Mountain spotted fever	f.	None of the above
7.	Zika		
8.	Q fever		
9.	Lyme disease		
10.	Leptospirosis		
		c. respective insect vectors in Column B.	The severe infection is called Weil-Felix disease. It presents with skin lesion known as erythema chronicum MATCHING TYPE: Match the following diseases in Column A with their

A

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