

Question	Rationale								
1. The following are commonly used dyes in simple staining, except; a. Methylene blue b. Eosin red c. Crystal violet d. Basic fuchsin	Answer: B. Eosin red Rationale: Simple staining - Use of single stain to color a bacterial cell Bacteria are: NEGATIVELY CHARGE (Anionic) = attraction to CA+IONIC chromophores and the organism <i>NOTE: Opposite Attracts!</i> Dyes used for simple staining are: - BASIC which; - Contain color-bearing ions (chromophores) that are positively charged. CATIONIC DYES Methylene blue - methylthioninium chloride Crystal violet - hexamethyl pararosaniline chloride Basic fuchsin - rosaniline hydrochloride ANIONIC/ACIDIC DYE Eosin red - will not stain bacteria because of the electrostatic forces that are involved.								
2. These organisms derive their energy needs from the breakdown of organic molecules by fermentation or respiration. a. Chemoorganotrophs b. Chemolithotrophs c. Photoautotrophs d. Photoheterotrophs	Answer: A. Chemoorganotrophs Rationale: BASED ON ENERGY SOURCE: Chemotrophs - obtain energy by oxidation of electron donors, may be: Chemoorganotrophs - Organic Chemolithotrophs - Inorganic Phototrophs: Utilizes light energy BASED ON CARBON SOURCE: Photoautotrophs - fix carbon as C source Photoheterotrophs - organic compounds as C source <table border="1"> <thead> <tr> <th colspan="2">Nutritional Requirements</th></tr> </thead> <tbody> <tr> <td>Energy Source</td><td> Phototrophs • Light Chemotrophs • Redox Potential (medically important) </td></tr> <tr> <td>Carbon Requirement</td><td> Heterotrophs / Organotrophs • Organic Carbon (medically important) Autotrophs / Lithotrophs • Inorganic Carbon </td></tr> <tr> <td colspan="2"> Combination • Energy source is light + carbon req is organic carbon = PHOTOHETEROTROPHS / PHOTOORGANOTROPHS • ES is redox + CR inorg carbon = CHEMOAUTOTROPHS/CHEMOLITHOTROPHS • MEDICALLY IMPORTANT ORGANISMS: ○ ES: Redox potential + CR org carbon = ■ CHEMOHETEROTROPHS ■ CHEMOORGANOTROPHS </td></tr> </tbody> </table>	Nutritional Requirements		Energy Source	Phototrophs • Light Chemotrophs • Redox Potential (medically important)	Carbon Requirement	Heterotrophs / Organotrophs • Organic Carbon (medically important) Autotrophs / Lithotrophs • Inorganic Carbon	Combination • Energy source is light + carbon req is organic carbon = PHOTOHETEROTROPHS / PHOTOORGANOTROPHS • ES is redox + CR inorg carbon = CHEMOAUTOTROPHS/CHEMOLITHOTROPHS • MEDICALLY IMPORTANT ORGANISMS: ○ ES: Redox potential + CR org carbon = ■ CHEMOHETEROTROPHS ■ CHEMOORGANOTROPHS	
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3. Media that allows certain bacteria to grow but will inhibit others from growing. a. Differential medium b. Selective medium c. Specific medium d. Defined medium	Answer: B. Selective medium <table><tr><th colspan="2">CULTURE MEDIA (FUNCTION/USE)</th></tr><tr><td>Differential Medium</td><td>Contains substance that differentiate some bacteria from other bacteria (color reactions)</td></tr><tr><td>Defined Medium</td><td>Exact composition is known</td></tr><tr><td>Complex Medium</td><td>Exact composition is not known</td></tr><tr><td>Enrichment Medium</td><td>For fastidious organisms, contain special substances for growth Ex: ★ Enrichment- BAP AND GAP</td></tr><tr><td>Reducing Medium</td><td>For anaerobes Ex: ★ Reducing - Thioglycollate Broth(only) → GasPak/Candle Jar</td></tr><tr><td>Selective Medium</td><td>Allows certain bacteria to grow but will inhibit others from growing Ex: ★ Selective - MCA</td></tr></table>	CULTURE MEDIA (FUNCTION/USE)		Differential Medium	Contains substance that differentiate some bacteria from other bacteria (color reactions)	Defined Medium	Exact composition is known	Complex Medium	Exact composition is not known	Enrichment Medium	For fastidious organisms, contain special substances for growth Ex: ★ Enrichment- BAP AND GAP	Reducing Medium	For anaerobes Ex: ★ Reducing - Thioglycollate Broth(only) → GasPak/Candle Jar	Selective Medium	Allows certain bacteria to grow but will inhibit others from growing Ex: ★ Selective - MCA														
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4. ★ Conditions in autoclave sterilization: a. 120°C, 15 psi, 15 minutes b. 121°C, 15 psi, 30 minutes c. 121°C, 15 psi, 15 minutes d. 120°C, 15 psi, 30 minutes	C. 121°C, 15 psi, 15 minutes <table><tr><th colspan="4">STERILIZATION METHODS</th></tr><tr><th></th><th>MOA</th><th>METHOD</th><th>BIOLOGICAL INDICATOR</th></tr><tr><td>Moist Heat</td><td>Protein coagulation</td><td>Autoclave: 121°C 15 psi 15 minutes</td><td><i>Bacillus stearothermophilus</i></td></tr><tr><td>Dry Heat</td><td>Oxidation</td><td>Oven 160-170°C, for 2-4 hours</td><td><i>Bacillus subtilis</i></td></tr><tr><td>Membrane Filtration (toxin, vaccines, enzymes)</td><td>Physical separation</td><td>0.2 micron filter For heat labile solutions “Cold sterilization”</td><td><i>Brevundimonas diminuta</i></td></tr><tr><td>Gas Sterilization (for packaging materials)</td><td>Alkylation</td><td>Ethylene oxide Alt.: formaldehyde, B-propiolactone</td><td><i>Bacillus subtilis</i></td></tr><tr><td>Ionizing radiation (for sterilization of production areas)</td><td>DNA mutation</td><td>Gamma and cathode rays</td><td><i>Bacillus pumilus</i></td></tr></table>	STERILIZATION METHODS					MOA	METHOD	BIOLOGICAL INDICATOR	Moist Heat	Protein coagulation	Autoclave: 121°C 15 psi 15 minutes	<i>Bacillus stearothermophilus</i>	Dry Heat	Oxidation	Oven 160-170°C, for 2-4 hours	<i>Bacillus subtilis</i>	Membrane Filtration (toxin, vaccines, enzymes)	Physical separation	0.2 micron filter For heat labile solutions “Cold sterilization”	<i>Brevundimonas diminuta</i>	Gas Sterilization (for packaging materials)	Alkylation	Ethylene oxide Alt.: formaldehyde, B-propiolactone	<i>Bacillus subtilis</i>	Ionizing radiation (for sterilization of production areas)	DNA mutation	Gamma and cathode rays	<i>Bacillus pumilus</i>
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5. This test is valuable in testing water for sewage contamination.

- IMViC test
- Nitrate reduction test
- Urea hydrolysis test
- Reductase test

A. IMViC test

IMViC Test	Indole, Methyl red, Voges-Proskauer, and Citrate Test			
	It is used to differentiate E.coli for Enterobacter aerogenes despite the two being very similar in morphological and physiological characteristics			
	I	M	V	C
<i>E. Coli</i>	+	+	-	-
<i>E. aerogenes</i>	-	-	+	+

Nitrate Reduction Test	Determines whether an organism, can reduce nitrate to nitrite or other nitrogen products
Urea Hydrolysis Test	Determine the ability of an organism to split urea, through the production of the enzyme urease. (e.g. <i>Proteus</i>)
Reductase Test	Test for quality of milk through Methylene blue reduction

6. Noncellular entities which are sometimes regarded as straddling the border between life and nonlife.

- Bacteria
- Prions
- Viruses
- DNA

C. Viruses

Viruses	- Acellular particles consisting of only one type of nucleic acid (DNA or RNA) surrounded by a protein coat - Can only reproduce by using the cellular machinery of other organisms - Thus, they can only be considered as living when they multiply within host cells they infect. Outside living hosts, they are inert. - Noncellular entities which are sometimes regarded as straddling the border between life and nonlife.
Bacteria	Cellular, living organisms, prokaryotic cells, capable of independent metabolism and reproduction
Prions	Infectious misfolded proteins and are acellular, but they do not contain genetic material
DNA	Nucleic acid/genetic material

7. Which of the following is not a component of the gram-negative cell wall?

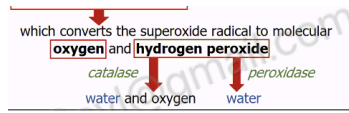
- Peptidoglycan
- Teichoic acid
- Lipid A
- Porins

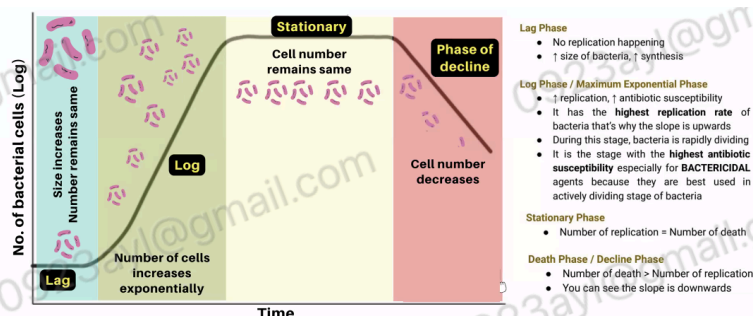
B. Teichoic acid

Gram-negative Cell Wall

- Contain **5-10% peptidoglycan** (murein), an outer membrane composed of **lipopolysaccharides**.
- Lipopolysaccharides are composed of **Lipid A**, which functions as **endotoxin**, core polysaccharide, and O antigen.

	Gram-Positive	Gram-Negative
Gram reaction	blue/violet	red/pink

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8. Which of the following organisms cannot produce the enzyme SOD? a. Anaerobes b. Aerobes c. Aerotolerant anaerobes d. None of these	A. Anaerobes Superoxide radicals - Formed in small amounts during the normal respiration of organisms - So toxic to cells that organisms attempting to grow in atmospheric oxygen must produce an enzyme, superoxide dismutase (SOD) to neutralize them. - Who produces this enzyme? - Aerobes - O₂ - Facultative anaerobes - with or without O₂ - Aerotolerant anaerobes - tolerates O₂ which converts the superoxide radical to molecular oxygen and hydrogen peroxide  The diagram shows a flowchart where a superoxide radical is converted to molecular oxygen and hydrogen peroxide by the enzyme catalase. Then, hydrogen peroxide is converted to water and oxygen by the enzyme peroxidase. Obligate anaerobes - Lack / insufficient SOD → cannot detoxify superoxide → oxygen sensitive Memory trick: “No SOD = No O₂” → organisms that lack adequate SOD are unable to tolerate oxygen well.												
9. This is the phase of microbial growth wherein the number of microbial deaths balances the number of new cells. a. Lag phase b. Log phase c. Stationary phase d. Death phase	C. Stationary phase Lag Phase - No replication - Increase size of bacteria - increase synthesis Log Phase - exponential logarithmic growth; cell division - ↑ replication ↑ antibiotic susceptibility - It has the highest replication rate of bacteria that's why the slope is upwards - During this stage, bacteria is rapidly dividing - It is the stage with the highest antibiotic susceptibility especially for BACTERICIDAL agents because they are best used in actively dividing stage of bacteria Stationary phase - Number of replication = Number of deaths Phase of decline (Death Phase) - Cell number decreases												



10. Which of the following pairs is not matched?

- Radiation – Oxidation
- Autoclaving – Protein denaturation
- Direct flaming – Burning contaminants to ashes
- Pasteurization – Protein denaturation

A. Radiation – Oxidation

Rationale: **STERILIZATION METHODS**

	MOA	METHOD	BIOLOGICAL INDICATORS
Moist Heat / Autoclaving	Protein coagulation / Protein Denaturation	Autoclave: 121°C, 15psi, 15 minutes	<i>Bacillus stearothermophilus</i>
Dry Heat / Hot air sterilization	Oxidation	Oven 160-170°C for 2-4 hours	<i>Bacillus subtilis</i>
Membrane filtration (toxin, vaccines, enzymes)	Physical separation	0.2 micron filter For heat labile solutions "Cold sterilization"	<i>Brevundimonas diminuta</i>
Gas sterilization (For packaging material)	Alkylation	Ethylene oxide Alternative: Formaldehyde B- propiolactone	<i>Bacillus subtilis</i>
Ionizing radiation (for sterilization of production areas)	DNA Mutation Destruction or damage of DNA	Gamma and cathode rays	<i>Bacillus pumilus</i>
Direct flaming	Burning contaminants to ashes		
Pasteurization	Protein denaturation		

11. Which of the following metals has the strongest oligodynamic action?

- Silver
- Mercury
- Iron
- Copper

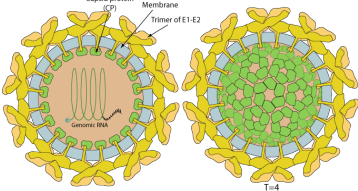
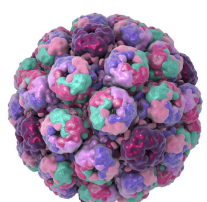
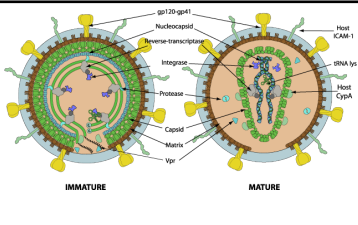
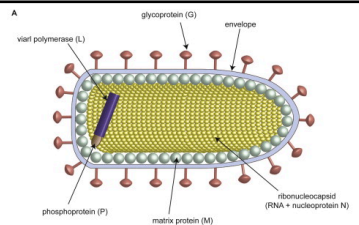
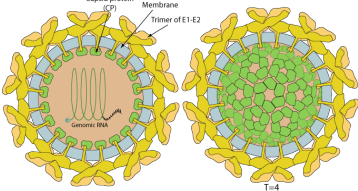
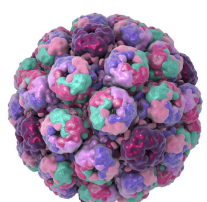
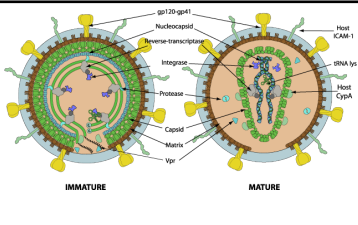
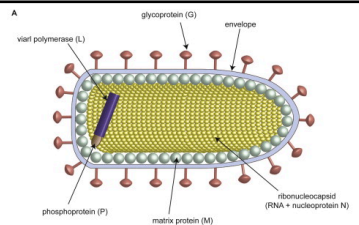
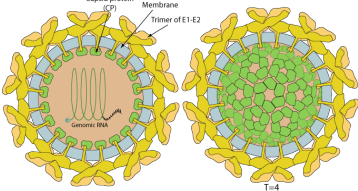
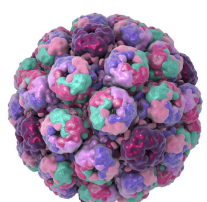
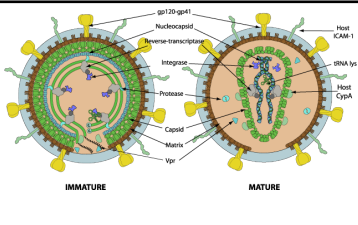
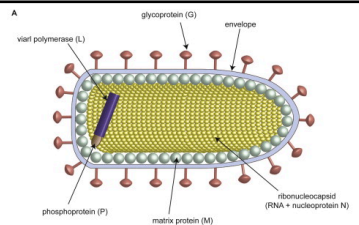
A. Silver (Ag - against germs)

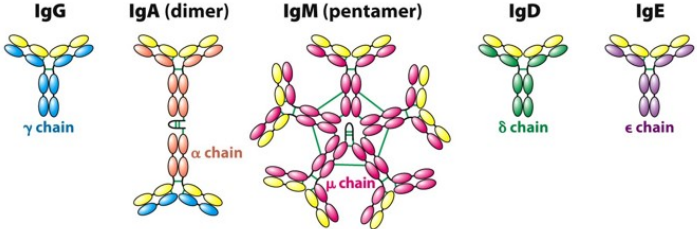
Oligodynamic action refers to the ability of very small amounts of heavy metals to exert antimicrobial activity.

- This is produced when the metalions combine with the sulfhydryl groups on cellular proteins, after which denaturation results.

- Silver (Ag) = strongest**
- Ag → Against germs

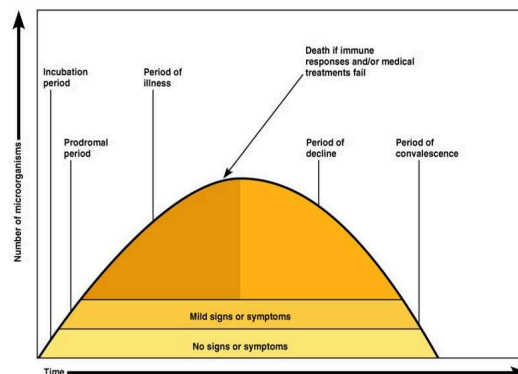
12. The phenomenon which occurs if there is <i>Candida albicans</i> overgrowth during use of broad-spectrum antibiotics. a. Mixed infection b. Subclinical infection c. Secondary infection d. Superinfection	D. Superinfection <table border="1"> <tr> <td>Mixed Infection</td><td>Occurs when TWO OR MORE different microorganisms cause an infection SIMULTANEOUSLY</td></tr> <tr> <td>Subclinical infection</td><td>An infection that produces no apparent clinical signs or symptoms</td></tr> <tr> <td>Secondary infection</td><td>An infection that develops after or as a complication of a primary infection, often caused by a different organism</td></tr> <tr> <td>Superinfection</td><td>A type of secondary infection which results from the destruction of many organisms of the normal microbiota, usually following the use of broad-spectrum antibiotics</td></tr> </table>	Mixed Infection	Occurs when TWO OR MORE different microorganisms cause an infection SIMULTANEOUSLY	Subclinical infection	An infection that produces no apparent clinical signs or symptoms	Secondary infection	An infection that develops after or as a complication of a primary infection, often caused by a different organism	Superinfection	A type of secondary infection which results from the destruction of many organisms of the normal microbiota, usually following the use of broad-spectrum antibiotics
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13. Enzymatic destruction or inactivation is one mechanism by which bacteria obtain resistance to antibiotics. Sulfanilamide is one such example of an antibiotic. a. The first statement is true but the second statement is false b. The first statement is false but the second statement is true. c. Both statements are true. d. Both statements are false.	A. The first statement is true but the second statement is false. 1st Statement: Enzymatic destruction or inactivation is one mechanism by which bacteria obtain resistance to antibiotics 2nd Statement: Sulfanilamide is one such example of an antibiotic. - Rationale: Antibiotics are substances produced by microorganisms that in small amounts inhibit another microorganism. Sulfa drugs are synthetically produced, therefore not classified as antibiotics.								
14. Property of an ideal antimicrobial agent: a. Broad spectrum of activity b. Produces drug resistance c. Produces hypersensitivity d. None of these	D. None of these Ideal antimicrobial agents must: • possess SELECTIVE toxicity • not produce drug RESSISTANT t nor adverse reactions • preferably be of NARROW not affect the normal microbiota. <u>Ideal antimicrobial = Selective toxicity + Narrow spectrum + No resistance + Minimal adverse effects</u> Important distinction: Broad-spectrum = useful clinically when the pathogen is unknown. Narrow-spectrum = preferred for an Ideal antimicrobial once the pathogen is identified								
15. Coliforms are defined as aerobic or facultatively anaerobic, gram-positive, non-endospore forming, rod-shaped bacteria that ferment lactose to form gas within 48 hours of being placed in lactose broth at 35°C. The most common method for directly determining the presence and number of coliforms is the membrane filtration method.	B. The first statement is false but the second statement is true. Coliforms are defined as aerobic or facultatively anaerobic, gram positive, non-endospore forming, rod-shaped bacteria that ferment lactose to form gas within 48 hours of being placed in lactose broth at 35°C. <u>Coliforms are Gram-negative rods.</u>								

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16. This is a measure of the biologically degradable organic matter in water. a. BOD b. DOM c. BOM d. BDM	A. BOD BOD stands for biochemical oxygen demand. - Measures the oxygen consumed by microorganisms as they break down biodegradable organic matter. - It is determined by the amount of oxygen required by bacteria to metabolize the organic matter. A LOWER BOD is desired.								
17. The following are vertically-transmitted infections, except: a. Toxoplasmosis b. Rubella c. Hepatitis B d. Herpes simplex	B. Rubella Vertically transmitted diseases: Toxoplasmosis Rubella (<i>what happened bella?</i>) Cytomegalovirus Herpes simplex, Hepatitis B Epstein-Barr virus Syphilis								
18. Bullet-shaped viruses with a spiked envelope. a. Togaviridae b. Papovaviridae c. Rhabdoviridae d. Retroviridae	C. Rhabdoviridae Rhabdoviruses, such as the rabies virus, have a characteristic bullet shape <table border="1"> <thead> <tr> <th>Togaviridae</th><th>Papoviridae</th></tr> </thead> <tbody> <tr> <td>  </td><td>  </td></tr> <tr> <th>Retroviridae</th><th>Rhabdoviridae</th></tr> <tr> <td>  </td><td>  </td></tr> </tbody> </table>	Togaviridae	Papoviridae			Retroviridae	Rhabdoviridae		
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20. Antigens present on red blood cells that determine a person's ABO blood type. a. Carbohydrate b. Proteins c. Lipids d. Nucleic acids	A. Carbohydrates ABO antigens are specific carbohydrate chains attached to glycolipids and glycoproteins on the RBC membrane.																																							
21. This antibody is present in mucous membranes and in body secretions such as mucus, saliva, tears, and breastmilk. a. IgG b. IgM c. IgA d. IgD	C. IgA <table><tr><td>IgM (Malaki, Mauuna)</td><td>Pentamer</td><td>Appears first in response to a primary infection</td></tr><tr><td>IgA (BasA : luha, sAliva)</td><td>Dimer</td><td>Most abundant in the body, present in secretions</td></tr><tr><td>IgD</td><td>Monomer</td><td>Found in the surface of B cells</td></tr><tr><td>IgG (PreGGy)</td><td>Monomer</td><td>Abundant in I serum, crosses placenta, enhances phagocytosis</td></tr><tr><td>IgE (AllergE)</td><td>Monomer</td><td>Mast cells and basophils, participate in allergic reaction</td></tr></table> 	IgM (Malaki, Mauuna)	Pentamer	Appears first in response to a primary infection	IgA (BasA : luha, sAliva)	Dimer	Most abundant in the body, present in secretions	IgD	Monomer	Found in the surface of B cells	IgG (PreGGy)	Monomer	Abundant in I serum, crosses placenta, enhances phagocytosis	IgE (AllergE)	Monomer	Mast cells and basophils, participate in allergic reaction																								
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22. True about endotoxins, except: a. Fever-producing b. Low toxicity c. Metabolic product of growing cell d. High stability	C. Metabolic product of growing cell <table><tr><th></th><th>Exotoxin</th><th>Endotoxin</th></tr><tr><td>Source</td><td>G (+) G (-)</td><td>G (-) <i>Listeria monocytogenes</i></td></tr><tr><td>Composition</td><td>Proteins</td><td>Lipopolysaccharides (Lipid A)</td></tr><tr><td>Part of the cell wall?</td><td>No, Metabolic product of growing cell</td><td>Yes</td></tr><tr><td>Stability</td><td>Unstable</td><td>Stable</td></tr><tr><td>Toxicity</td><td>High toxicity</td><td>Low toxicity</td></tr><tr><td>Potency</td><td>More potent</td><td>Less potent</td></tr><tr><td>Heat</td><td>Heat-labile</td><td>Heat stable</td></tr><tr><td>Regions</td><td>A: Activity B: Binding</td><td></td></tr><tr><td>Defense</td><td>IgM, IgG</td><td>---</td></tr><tr><td>Significance</td><td>Source of toxoids</td><td>Septic shock</td></tr><tr><td>Symptoms</td><td>Specific symptoms</td><td>General symptoms such as fever, weakness, aches, shock</td></tr><tr><td>Examples</td><td>Tetanus, botulism, diphtheria, scarlet fever</td><td>Typhoid, UTI, meningococcal meningitis</td></tr></table>		Exotoxin	Endotoxin	Source	G (+) G (-)	G (-) <i>Listeria monocytogenes</i>	Composition	Proteins	Lipopolysaccharides (Lipid A)	Part of the cell wall?	No, Metabolic product of growing cell	Yes	Stability	Unstable	Stable	Toxicity	High toxicity	Low toxicity	Potency	More potent	Less potent	Heat	Heat-labile	Heat stable	Regions	A: Activity B: Binding		Defense	IgM, IgG	---	Significance	Source of toxoids	Septic shock	Symptoms	Specific symptoms	General symptoms such as fever, weakness, aches, shock	Examples	Tetanus, botulism, diphtheria, scarlet fever	Typhoid, UTI, meningococcal meningitis
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23. The time interval between the infection of a susceptible person and the appearance of symptoms of the disease. a. Prodromal period b. Period of illness	D. Period of incubation <table><tr><th colspan="2">Stages of infection</th></tr><tr><td>Incubation</td><td>Pre-pathogenesis, no signs and symptoms. Time between exposure and</td></tr></table>	Stages of infection		Incubation	Pre-pathogenesis, no signs and symptoms. Time between exposure and																																			
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- c. Period of convalescence
d. Period of incubation

	appearance of first signs and symptoms.
Prodrome	WITH signs and symptoms
Acme/Peak of Illness	When the disease is at its peak
Decline	Subsides
Convalescence	Where symptoms decline and body is restored to normal and healthy condition.



24. The spores of which organisms are used as a biological indicator of sterilization?

- a. Bacillus stearothermophilus
b. Salmonella typhi
c. Bacillus subtilis
d. Staphylococcus aureus

A. Bacillus stearothermophilus

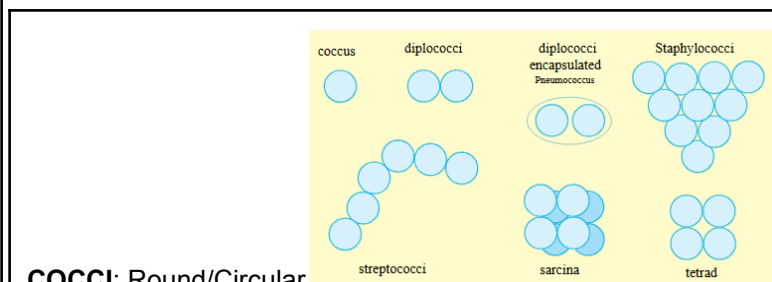
Refer to number 10 (Table)

25. True about bacterial cell shape and arrangement, except:

- a. Spirillas are helical bacteria which are rigid, while spirochetes are flexible helical bacteria
b. Vibrios are comma shaped rods.
c. Neisseria gonorrhoeae is an example of a diplococci
d. Pleomorphic organisms have rigid forms.

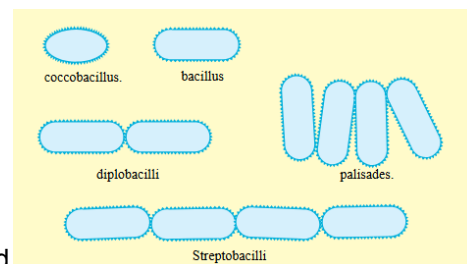
D. Pleomorphic organisms have rigid forms.

Pleomorphic organisms exist in varied forms; examples are haemophilus, legionella.



COCCI: Round/Circular

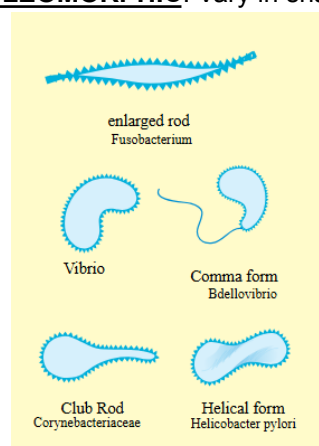
- Coccus - single
- Diplococci - pairs
- Diplococci encapsulated (pneumococcus)
- Tetrad - by fours
- Sarcina - by eights
- Staphylococci - in cluster
- Streptococci - in chains



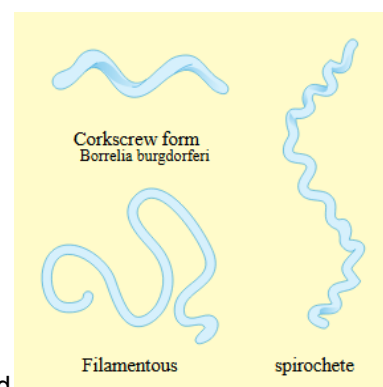
BACILLUS: rod-shaped

- Coccobacillus - organisms that are too short to be bacillus but too long to be coccus
- Bacillus
- Diplobacilli - pairs
- Palisades
- Streptobacilli - chains

PLEOMORPHIC: Vary in shape



SPIROCHETES: Spiral shaped



26. A sample of E. coli has been subjected to heat for a specified time and 90% of the cells have been destroyed. Which of the following terms best describes this event?

- Thermal death point
- Thermal death time
- Decimal reduction time

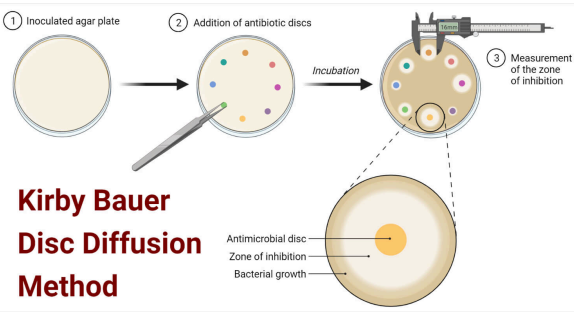
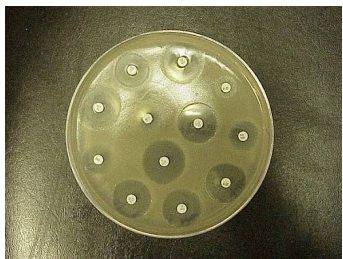
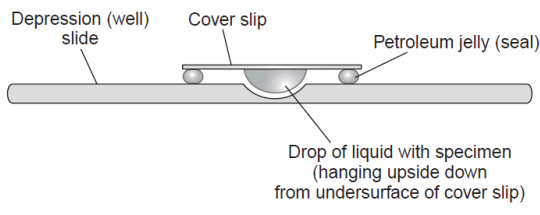
C. Decimal reduction time (D-Value)

Thermal Death Point (TDP)

Lowest temperature at which all the microorganisms in a particular liquid suspension will be killed in 10 minutes.

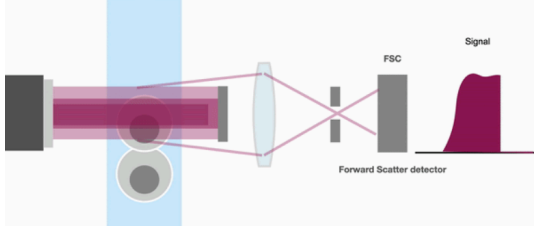
Thermal Death Time

Minimal / shortest time for all bacteria to

d. Bactericidal point	<table border="1"> <tr> <td>(TDT)</td><td>be killed at a given temperature</td></tr> <tr> <td>Decimal Reduction (DRT)</td><td>Aka: D-value Time in minutes in which 90% of the population of bacteria in a given temperature will be killed</td></tr> </table>	(TDT)	be killed at a given temperature	Decimal Reduction (DRT)	Aka: D-value Time in minutes in which 90% of the population of bacteria in a given temperature will be killed
(TDT)	be killed at a given temperature				
Decimal Reduction (DRT)	Aka: D-value Time in minutes in which 90% of the population of bacteria in a given temperature will be killed				
27. In the Kirby-Bauer susceptibility test, the presence of a zone of inhibition around a disk containing antimicrobial agents indicate. a. That the microbe does not grow well in the presence of the agent. b. That the microbes are killed by the antimicrobial agent. <i>*Can be cidal or static</i> c. The smallest amount of the agent that will inhibit the growth of the microbe. <i>*Not smallest</i> d. The amount of microbe that a particular concentration of agent can inhibit.	A. That the microbe does not grow well in the presence of the agent Kirby-Bauer susceptibility test / Disk-diffusion method: a disk of filter paper is soaked with the antimicrobial and placed on an agar plate that has been previously inoculated with the test organism. After incubation, a clear zone around the disks represents inhibition of growth.  Kirby Bauer Disc Diffusion Method 				
28. Motility is observed best with a: a. Hanging drop preparation b. Flagellar stain c. Negative stain d. Gelatin stab	A. Hanging drop preparation 				
29. Bacterial growth is expressed mathematically as linear, and this is a reflection of their growth by budding. A. The first statement is true but the second statement is false. B. The first statement is false but the second statement is true. C. Both statements are true. D. Both statements are false.	D. Both statements are false. Bacterial growth is mathematically exponential. This is due to their reproduction by binary fission.				
30. Antimicrobial spectrum of metronidazole:	D. I, II, III				

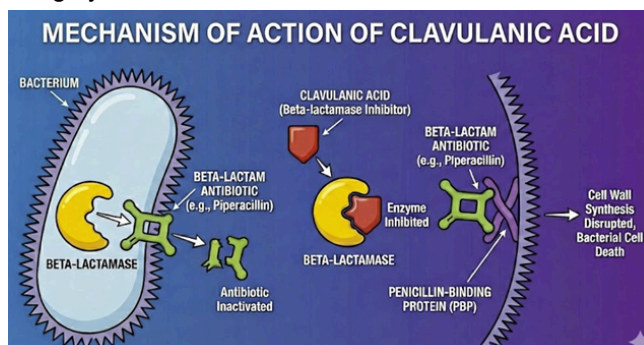
I. Giardia lamblia II. Entamoeba histolytica III. Trichomonas vaginalis A. I and II B. II and III C. I and III D. I, II, III	GET MET aw! (Sexbomb) Metronidazole (Flagyl) is for anaerobic infections that occur <u>lower than the torso</u>. Clindamycin is used for anaerobic infections <u>above the torso</u>.								
31. A primary zoonotic disease associated with the ingestion of contaminated milk: A. Anthrax B. Diphtheria C. Brucellosis D. Lyme disease	C. Brucellosis Brucellosis is also called undulant fever (rising and falling fever), malta fever, and Bang's disease. Caused by 3 species of the Brucella genus: • <i>B. abortus</i> (cow) • <i>B. melitensis</i> (goat) • <i>B. suis</i> (pig) The most common cause is <i>B. melitensis</i>, which is often found in unpasteurized goat milk products. Rationale why others are not the answer: Anthrax - infected specie not in contaminated milk Diphtheria - droplets Lyme - vector-borne disease								
32. An effective pore size to filter out most rigid bacteria is approximately. A. 25 µm B. 10 µm C. 0.20 µm D. 0.10 µm	C. 0.20 µm High efficiency particulate air (HEPA) filters: • removes almost all microorganisms larger than about 0.3µm Membrane filters: • 0.22µm and 0.45µm pore size; 0.01 µm: retains viruses and even large protein molecules								
33. Bacteria used in agricultural pest control: A. Bacillus thuringensis B. Bacillus anthracis C. Bacillus cereus D. Epulopsicium fishelsoni	A. Bacillus thuringensis <table border="1" data-bbox="707 1391 1503 1787"> <tr> <td>Bacillus thuringensis</td><td>Agricultural pest control Best-known microbial insect pathogen. When it sporulates, it produces intracellular crystals that are toxic to insects. Commercial preparations of endospores and crystalline toxin of <i>B. thuringensis</i> are available.</td></tr> <tr> <td>Bacillus anthracis</td><td>Causes anthrax</td></tr> <tr> <td>Bacillus cereus</td><td>"Chinese fried rice syndrome"</td></tr> <tr> <td>Epulopsicium fishelsoni</td><td>Known for their unusually large size, has symbiotic relationship with surgeonfish</td></tr> </table>	Bacillus thuringensis	Agricultural pest control Best-known microbial insect pathogen. When it sporulates, it produces intracellular crystals that are toxic to insects. Commercial preparations of endospores and crystalline toxin of <i>B. thuringensis</i> are available.	Bacillus anthracis	Causes anthrax	Bacillus cereus	"Chinese fried rice syndrome"	Epulopsicium fishelsoni	Known for their unusually large size, has symbiotic relationship with surgeonfish
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Bacillus anthracis	Causes anthrax								
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34. Opportunistic fungi, except: A. Candida albicans B. Histoplasma capsulatum C. Pneumocystis jiroveci D. Cryptococcus neoformans	B. Histoplasma capsulatum Opportunistic = "takes the opportunity" when your body's defenses are weak. Other opportunistic fungi: • <i>Aspergillus fumigatus</i>								

	Rhizopus <i>Candida albicans</i> - candidiasis <i>Pneumocystis jirovecii</i> - pneumonia <i>Cryptococcus neoformans</i> - cryptococcosis										
35. Causative agent of Lyme disease: A. <i>Borrelia burgdorferi</i> B. <i>Candida albicans</i> C. <i>Salmonella typhi</i> D. <i>Limulus polyphemus</i>	A. <i>Borrelia burgdorferi</i> <table border="1"> <tr> <td><i>Borrellia burdorferi</i></td><td><i>Borrelia burgdorferi</i> is a spirochete which causes Lyme disease Vector: Ixodes ticks Reservoir: Forest animals Diagnosed by: Western blotting</td></tr> <tr> <td><i>Candida albicans</i></td><td>causes candidiasis</td></tr> <tr> <td><i>Salmonella typhi</i></td><td>causes typhoid fever</td></tr> <tr> <td><i>Limulus polyphemus</i></td><td>The horseshoe crab, not a disease causing bacterium</td></tr> </table>	<i>Borrellia burdorferi</i>	<i>Borrelia burgdorferi</i> is a spirochete which causes Lyme disease Vector: Ixodes ticks Reservoir: Forest animals Diagnosed by: Western blotting	<i>Candida albicans</i>	causes candidiasis	<i>Salmonella typhi</i>	causes typhoid fever	<i>Limulus polyphemus</i>	The horseshoe crab , not a disease causing bacterium		
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36. Method of transmission of the influenza virus: A. Direct contact B. Indirect contact C. Droplet transmission D. Food and water contamination	C. Droplet transmission * Transmission routes involving a combination of hand & surface = indirect contact. <table border="1"> <tr> <td>Direct contact</td><td>Physical contact ex: STD</td></tr> <tr> <td>Indirect</td><td>Contact with a contaminated surface</td></tr> <tr> <td>Droplet transmission</td><td>Coughing or sneezing MALAKI</td></tr> <tr> <td>Airborne transmission</td><td>Contaminated dust particles or droplet nuclei (residue from dried droplets) ex. Pneumonia, TB, Chicken pox</td></tr> <tr> <td>Food and water contamination</td><td>Fecal oral transmission</td></tr> </table>	Direct contact	Physical contact ex: STD	Indirect	Contact with a contaminated surface	Droplet transmission	Coughing or sneezing MALAKI	Airborne transmission	Contaminated dust particles or droplet nuclei (residue from dried droplets) ex. Pneumonia, TB, Chicken pox	Food and water contamination	Fecal oral transmission
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Food and water contamination	Fecal oral transmission										
37. A method used to identify bacteria in a sample without culturing the bacteria. A. Flow cytometry B. Phage typing C. Immunofluorescence D. ELISA	A. Flow cytometry In flow cytometry, a moving fluid containing bacteria is forced through a small opening. The presence of bacteria is determined by detecting the difference in electrical conductivity between cells and the surrounding medium.										

	Phage typing - test for determining which phages a bacterium is susceptible to 								
38. A nosocomial pathogen that normally inhabits the skin and commonly contaminates prosthetic devices such as catheters and heart valves. A. Staphylococcus aureus B. Staphylococcus epidermidis C. Streptococcus pyogenes D. Streptococcus mutans	B. Staphylococcus epidermidis - pathogen lang siya kapag nakapasok sa skin Represents 90% of the normal microbiota of the skin and is pathogenic only when the skin is broken or is invaded by medical Procedures. On the surface of the catheter they are encapsulated, causing them to become resistant to desiccation and disinfectants. Nosocomial - infections acquired from the hospital Enterococcus faecium Staphylococcus aureus Klebsiella pneumoniae Acinetobacter baumannii Pseudomonas aeruginosa Enterobacter spp <table border="1" data-bbox="707 1070 1501 1509"> <tr> <td>Staphylococcus aureus</td><td>4th disease: Scalded skin syndrome Acute endocarditis Staph TSS</td></tr> <tr> <td>Staphylococcus epidermidis</td><td>#1 skin flora Stitch abscess</td></tr> <tr> <td>Streptococcus pyogenes</td><td>Group A beta-hemolytic streptococcus Responsible for Scarlet fever - Dick's test <i>Scarlet ang Dick ni A Pyo</i></td></tr> <tr> <td>Streptococcus mutans</td><td>Viridans strep Dental caries</td></tr> </table>	Staphylococcus aureus	4th disease: Scalded skin syndrome Acute endocarditis Staph TSS	Staphylococcus epidermidis	#1 skin flora Stitch abscess	Streptococcus pyogenes	Group A beta-hemolytic streptococcus Responsible for Scarlet fever - Dick's test <i>Scarlet ang Dick ni A Pyo</i>	Streptococcus mutans	Viridans strep Dental caries
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39. Third generation cephalosporins: A. Cefaclor, Cefuroxime, Loracarbef B. Cephalexin, Cefazolin, Cefadroxil C. Ceftriaxone, Cefditoren, Cefdinir D. Cefepime, Cefpirome, Cefixime	C. Ceftriaxone, Cefditoren, Cefdinir Cephalosporin Antibiotics Made Easy - Simple Trick!! Beta-lactam; Grouped into 5 generations <table><thead><tr><th>1st Generation "FA/PHA"</th><th>2nd Generation "Everything Else"</th><th>3rd Generation "ONE/TEN/IME"</th><th>4th Generation "PI"</th><th>5th Generation "ROL"</th></tr></thead><tbody><tr><td>* CEFZOLIN CEFADROXIL * CEPHALEXIN CEPHALOTHIN CEPHAPIRIN CEPHRADINE</td><td>CEFOXITIN CEFOTETAN CEFMETAZOLE CEFPROZIL CEFACTOR CEFUROXIME</td><td>* CEFTRIAXONE CEFTIBUTEN * CEFOTAXIME * CEFTAZIDIME CEFPODOXIME CEFIXIME CEFDINIR MOXALACTAM</td><td>* CEFEPIME CEFPIROME</td><td>* CEFAROLINE CEFTOBIPROLE</td></tr></tbody></table>	1st Generation "FA/PHA"	2nd Generation "Everything Else"	3rd Generation "ONE/TEN/IME"	4th Generation "PI"	5th Generation "ROL"	* CEFZOLIN CEFADROXIL * CEPHALEXIN CEPHALOTHIN CEPHAPIRIN CEPHRADINE	CEFOXITIN CEFOTETAN CEFMETAZOLE CEFPROZIL CEFACTOR CEFUROXIME	* CEFTRIAXONE CEFTIBUTEN * CEFOTAXIME * CEFTAZIDIME CEFPODOXIME CEFIXIME CEFDINIR MOXALACTAM	* CEFEPIME CEFPIROME	* CEFAROLINE CEFTOBIPROLE
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40. A severe complication of chickenpox, influenza, and other viral diseases which affects children and is aggravated by the use of aspirin. A. Raynaud's phenomenon B. Q fever C. Reye's syndrome D. Gray baby syndrome	C. Reye's syndrome Q fever- <i>Coxiella burnetii</i> Gray baby syndrome - Chloramphenicol										
41. Diseases caused by exotoxins, except: A. Tetanus B. Rabies C. Diphtheria D. Botulism	B. Rabies Exotoxins: Tetanus - tetanospasmin Scarlet fever - Streptococcal pyrogenic exotoxins (SPE) Diphtheria - Toxin A Botulism - botulinum toxin Virus: Rabies - Rhabdoviridae										
42. Which of the following pairs are not matched? A. Augmentin: Amoxicillin + Clavulanate B. Unasyn: Ampicillin + Sulbactam C. Timentin: Ticarcillin + Sulbactam D. Zosyn: Piperacillin + Tazobactam	C. Timentin: Ticarcillin + Sulbactam Timentin: Ticarcillin + Clavulanate										
43. True about penicillins, except: A. Penicillin G is ineffective against most strains of <i>S. aureus</i> . B. Cloxacillin is a penicillinase-resistant drug. C. Amoxicillin is often combined with clavulanate to narrow its spectrum of activity. D. Piperacillin is active against <i>Pseudomonas aeruginosa</i> .	C. Amoxicillin is often combined with clavulanate to narrow its spectrum of activity. Clavulanate is a <u>beta-lactamase inhibitor</u> . It prevents the immediate hydrolysis of Amoxicillin, thus increasing its <u>potency</u> . Added Bacterial Coverage: By neutralising these resistance mechanisms, the combination (commonly known as co-amoxiclav or Augmentin) restores and expands coverage to include: <i>Staphylococcus aureus</i> (methicillin-susceptible strains that produce B-lactamase). <i>Haemophilus influenzae</i> and <i>Moraxella catarrhalis</i> (common causes of severe ear, sinus, and respiratory infections).										

- **Gram-negative gut bacteria** like B-lactamase-producing strains of *E. coli*, *Klebsiella*, and *Proteus*.
- **Anaerobic bacteria** found in the mouth and gut, making it highly effective for animal bites and dental abscesses



44. Which of the following bacteria is gram-positive?

- A. *Klebsiella pneumoniae*
B. *Neisseria gonorrhea*
C. *Clostridium tetani*
D. *Pseudomonas aeruginosa*

C. Clostridium tetani

Gram (+) Cocci

- Staphylococcus spp.
- Streptococcus

G(+) Rods: “My Colorful But Corny Love Life Never Ends”
SPORE-FORMING

- Clostridium
- Bacillus

NON-SPORE-FORMING

- Mycobacterium
- Corynebacterium
- Lactobacillus
- Listeria
- Nocardia
- Erysipelothrix

GRAM POSITIVE BACTERIA	
Gram (+) Cocci	Gram (+) Bacilli
Staphylococcus spp.	SPORE-FORMING
Streptococcus.	Bacillus spp.
	Clostridium spp.
	NON-SPORE FORMING
	Corynebacterium
	Listeria, Lactobacillus
	Erysipelothrix
	Actinomyces
	Nocardia
	Propionibacterium

G(+) rods:
My Colorful But Corny Love
Life Never Ends

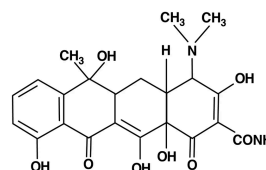
(Mycobacterium, Clostridium, Bacillus, Corynebacterium, Lactobacillus, Listeria, Nocardia, Erysipelothrix)



45. A long-acting tetracycline:

- A. Chlortetracycline
B. Doxycycline
C. Demeclocycline
D. Methacycline

B. Doxycycline



Short	Intermediate	Long
Tetracycline	Demeclocycline	Doxycycline
Chlortetracycline	Methacycline	Minocycline
Oxytetracycline		Tiacycline

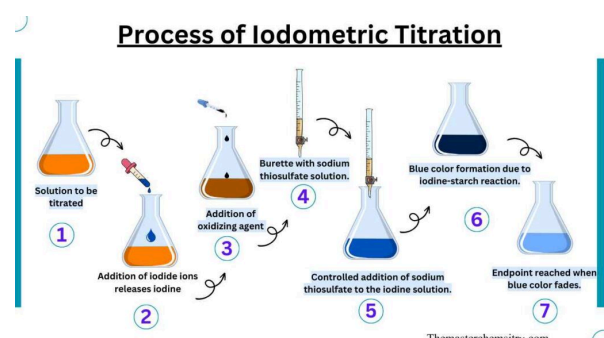
46. Major causes of bacterial meningitis: I. <i>Neisseria meningitidis</i> II. <i>Haemophilus influenzae</i> III. <i>Streptococcus pneumoniae</i> A. I only B. I and II C. I and III D. I, II, III	D. I, II, III H. influenzae - meningitis in children - reduced by <u>Hibs vaccine</u> S. pneumoniae - both children and adults						
47. The following drugs can be used for treatment of leprosy, except: A. Isoniazid B. Dapsone C. Rifampicin D. Clofazimine	A. Isoniazid Dapsone - key treatment for leprosy Rifampicin - <i>M. leprae</i> (Leprosy) Clofazimine - used for multi-drug resistant; multi-bacillary leprosy						
48. Uncontrolled proliferation of microbes in the blood: A. Sepsis B. Septicemia C. Septic shock D. Anaphylaxis	B. Septicemia <i>Blood</i> = “-emia” Sepsis - presence of a toxin or pathogen in the blood and tissue Septicemia - blood poisoning ; uncontrolled proliferation of microbes in the blood Septic shock - sudden drop in blood pressure induced by bacterial toxins Anaphylaxis - a hypersensitivity reaction involving IgE antibodies, mast cells, and basophils						
49. Aminoglycoside that causes both auditory and vestibular damage. A. Streptomycin B. Gentamicin C. Kanamycin D. Tobramycin	D. Tobramycin <table><tr><th>Nephrotoxic</th><th>Ototoxic</th><th>Vestibulotoxic</th></tr><tr><td>Neomycin (most) Gentamicin Tobramycin Least: Streptomycin</td><td>Neomycin Amikacin Kanamycin</td><td>Streptomycin Gentamicin (Tobramycin)</td></tr></table>	Nephrotoxic	Ototoxic	Vestibulotoxic	Neomycin (most) Gentamicin Tobramycin Least: Streptomycin	Neomycin Amikacin Kanamycin	Streptomycin Gentamicin (Tobramycin)
Nephrotoxic	Ototoxic	Vestibulotoxic					
Neomycin (most) Gentamicin Tobramycin Least: Streptomycin	Neomycin Amikacin Kanamycin	Streptomycin Gentamicin (Tobramycin)					
50. Vector-borne diseases, except: A. Trypanosomiasis B. Lyme disease C. Yellow fever D. Cryptosporidiosis	D. Cryptosporidiosis Trypanosomiasis - Glossina (Tsetse fly) Lyme - Ixodes (tick) Yellow fever - Aedes aegypti (mosquito) Cryptosporidiosis - fecal-oral ingestion of oocysts						
51. XDR TB, except: A. Resistant to INH B. Resistance to RIF C. Resistant to EMB D. Resistant to Amikacin	C. Resistant to EMB MDR-TB - Resistance to INH and RIF XDR-TB (Extensively Drug-Resistant Tuberculosis) - Old: - Resistance to INH and RIF + 3 of the 2nd line drugs - Now: - Resistance to INH and RIF,						

	FIACK (Fluoroquinolones, Amikacin, Capreomycin, Kanamycin)																				
52. Causative agent of the Black Death: A. <i>Sarcoptes scabiei</i> B. <i>Yersinia pestis</i> C. <i>Trypanosoma brucei</i> D. <i>Leptospira interrogans</i>	B. Yersinia pestis  Gram negative coccobacillus A. <i>Sarcoptes scabiei</i> - Scabies B. <i>Yersinia pestis</i> - black death C. <i>Trypanosoma brucei</i> - African sleeping sickness D. <i>Leptospira interrogans</i> - leptospirosis <u><i>Trypanosoma cruzi</i> - American sleeping sickness</u> - Tom Cruz - american																				
53. Which of the following pairs is not matched? A. Tetracycline – <i>Streptomyces aureofaciens</i> B. Griseofulvin – <i>Streptomyces griseus</i> C. Vancomycin – <i>Streptomyces orientalis</i> D. Neomycin – <i>Streptomyces fradiae</i>	B. Griseofulvin – <i>Streptomyces griseus</i> <table border="1"> <thead> <tr> <th>Source Organism</th><th>Antibiotic</th></tr> </thead> <tbody> <tr> <td><i>S. erythreus</i></td><td>Erythromycin</td></tr> <tr> <td><i>S. griseus</i></td><td>Streptomycin</td></tr> <tr> <td><i>S. lincolnensis</i></td><td>Lincomycin</td></tr> <tr> <td><i>S. orientalis</i></td><td>Vancomycin</td></tr> <tr> <td><i>S. roseosporus</i></td><td>Daptomycin</td></tr> <tr> <td><i>S. venezuelae</i></td><td>Chloramphenicol</td></tr> <tr> <td><i>S. orchidaceous</i></td><td>Cycloserine</td></tr> <tr> <td><i>S. nodosus</i></td><td>Amphotericin B</td></tr> <tr> <td><i>S. noursei</i></td><td>Nystatin</td></tr> </tbody> </table> Tetracycline - <i>Streptomyces aureofaciens</i> Griseofulvin - <i>Penicillium mold</i> Streptomycin <i>Streptomyces griseus</i> Vancomycin - <i>Streptomyces orientalis</i> <i>"Si Glyco may d-ala d-alang red na van papuntang Oriental Mindoro"</i> Neomycin - <i>Streptomyces fradiae</i>	Source Organism	Antibiotic	<i>S. erythreus</i>	Erythromycin	<i>S. griseus</i>	Streptomycin	<i>S. lincolnensis</i>	Lincomycin	<i>S. orientalis</i>	Vancomycin	<i>S. roseosporus</i>	Daptomycin	<i>S. venezuelae</i>	Chloramphenicol	<i>S. orchidaceous</i>	Cycloserine	<i>S. nodosus</i>	Amphotericin B	<i>S. noursei</i>	Nystatin
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54. Which of the following pairs is not matched? A. Phtirus pubis: crabs B. Haemophilus ducreyi : chancroid C. Human papilloma virus: genital warts D. Leishmania donovani: donovanosis	D. Leishmania donovani: donovanosis HPV 6 and 11: genital warts Leishmania donovani: visceral leishmaniasis (Kala-azar) <i>azar talo si donny</i> Klebsiella granulomatis: donovanosis (STI)																				
55. Addition of a nutrient to a food vehicle commonly consumed by the population to prevent or correct micronutrient deficiencies A. Food Supplementation B. Food Assistance	C. Food Fortification <table border="1"> <thead> <tr> <th colspan="2">Public Health Programs</th></tr> </thead> <tbody> <tr> <td>4 o'clock habit</td><td>Prevent dengue spread</td></tr> </tbody> </table>	Public Health Programs		4 o'clock habit	Prevent dengue spread																
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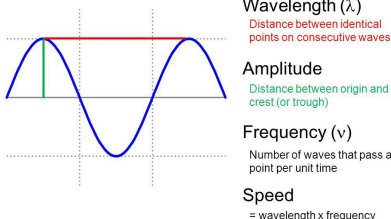
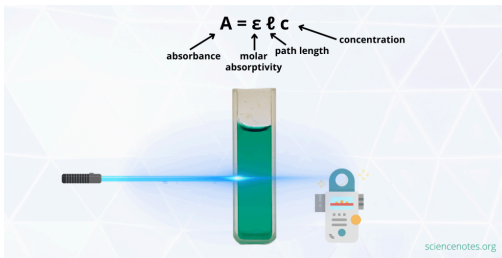
C. Food Fortification D. Food Nutrition	Sangkap Pinoy Seal Program (SPSP)		Encourage food manufacturers to fortify processed food and food products						
	Herbal and Traditional Medicine		Backyard gardening						
	National Objective for Health		Roadmap for Universal Healthcare Partnership with different sector						
	Sentrong Sigla		Availability of healthcare centers						
	National Drug Policy program		Guarantees better health outcomes by using policy instruments and setting strategic directors aimed at improving access to quality essential medicines						
	DOH Nutrition Program		Objective is to improve the survival of infants and young children by improving their nutritional status, growth, and development through optimal feeding and programs (ex: micronutritional supplementation salt, iodization, food fortifications, etc.) • Overnutrition • Undernutrition - Primary, Secondary						
56. The fraction of a population having a specific disease at a given time. A. Prevalence B. Incidence C. Morbidity rate D. Occurrence	A. Prevalence Prevalence - who currently has the disease (how many have it?) Incidence - measures new cases that develop within a population during a specific period how many GOT it?) Morbidity rate - refers to the rate of illness or disease in a population Occurrence - general term for presence or happening								
57. The point when an acid solution containing an indicator changes its color upon titration with a base is called A. Equivalence point B. Critical point C. pH shift point D. Endpoint	D. Endpoint Equivalence point: point where chemically equivalent amounts of titrant and analyte have reacted Critical Point: thermodynamic term; point where no phase boundaries exist (not related)								
58. Water content determination using residual titration with Karl Fischer Reagent is USP method A. IA B. IB C. IC	B. IB <table><tr><th colspan="3">Water Determination Official Methods</th></tr><tr><td>Method I</td><td>Titrimetric IA: Direct IB: Residual</td><td>KFR Components (SIPA) Sulfur dioxide</td></tr></table>			Water Determination Official Methods			Method I	Titrimetric IA: Direct IB: Residual	KFR Components (SIPA) Sulfur dioxide
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D. II	<table><tr><td></td><td>IC: Coloumetric</td><td>Iodine Pyridine Anhydrous methanol</td></tr><tr><td>Method II</td><td>A2eotropic - 2 luene</td><td>Toluene or Xylene</td></tr><tr><td>Method III</td><td>Gravimet3c</td><td>Loss on drying Inorganic: 110-120 Organic 105</td></tr></table>		IC: Coloumetric	Iodine Pyridine Anhydrous methanol	Method II	A2eotropic - 2 luene	Toluene or Xylene	Method III	Gravimet3c	Loss on drying Inorganic: 110-120 Organic 105												
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59. Acid insoluble ash refers to substances insoluble to A. 3N HCl B. 3N H ₂ SO ₄ C. 1N HCl D. 1N H ₂ SO ₄	A. 3N HCl Total ash - carbon free ash - total residue remaining after ignition Acid insoluble ash - Ash remaining after treatment with 3N HCl of the total ash & upon ignition Water soluble ash - total ash minus ash remaining after boiling with water and ignition																					
60. An assay of sodium bicarbonate used methylorange as an indicator. Upon endpoint, the solution is colored A. Orange B. Red C. Pink D. Yellow	C. Pink <table><tr><th>Indicator</th><th>Acid</th><th>Base</th></tr><tr><td>Methyl yellow</td><td>Red</td><td rowspan="3">Yellow</td></tr><tr><td>Methyl orange</td><td>Pink</td></tr><tr><td>Methyl red</td><td>Red</td></tr><tr><td>Malachite green</td><td rowspan="5">Yellow</td><td>Green</td></tr><tr><td>Bromophenol blue</td><td>Blue</td></tr><tr><td>Bromocresol purple</td><td>Purple</td></tr><tr><td>Phenol red</td><td>Red</td></tr><tr><td>Bromothymol blue</td><td>Blue</td></tr></table>	Indicator	Acid	Base	Methyl yellow	Red	Yellow	Methyl orange	Pink	Methyl red	Red	Malachite green	Yellow	Green	Bromophenol blue	Blue	Bromocresol purple	Purple	Phenol red	Red	Bromothymol blue	Blue
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61. Which of the following pairs is incorrectly matched? A. Sodium thiosulfate VS - K ₂ Cr ₂ O ₇ B. Perchloric Acid VS - KHC ₈ H ₄ O ₄ C. Hydrochloric Acid VS- Na ₂ CO ₃ D. Iodine VS - Sodium Oxalate	D. Iodine VS - Sodium Oxalate • K₂Cr₂O₇ (Potassium dichromate): Sodium thiosulfate VS • KHC₈H₄O₄(: Perchloric acid VS • Na₂CO₃(Sodium carbonate): HCl VS • As₂O₃(Arsenic trioxide): Iodine VS • Ceric sulfate: Sodium oxalate Note: Ceric sulfate is also available that requires no further standardization, but per USP 30, sodium oxalate is used as standard.																					

62. Indicator in Permanganometry. A. Starch KI paste B. Starch C. Oxalic acid D. None	D. None It is self indicating. Starch - Iodimetry and odometry Oxalic Acid - back titrant in KMnO4 Titrations Starch KI Paste - used in diazotization titration
63. The branch of Spectrometry that involves absorption at visible light A. Colorimetry B. UV Spectroscopy C. IR Spectroscopy D. NMR Spectroscopy	A. Colorimetry Colorimetry: involves absorption at visible light Other choices involve absorption at their specific wavelengths. • UV: 200 - 380 nm • Visible light: 380 - 780 nm • Near IR: 780 nm - 3000 nm • Medium IR (fingerprint): 3-15 um (3000-15000 nm) • Far IR: 15-300 um (15000-30000 nm)
64. Fluorometry is the A. Measurement of energy lost by emission B. Measurement of energy lost by transmitted light C. Measurement of energy lost by reflected light D. Measurement of energy lost by refracted light	A. Measurement of energy lost by emission Turbidimetry - measurement of energy lost by transmitted light Nephelometry - measurement of energy lost by reflected light
65. The precision measured after a few minutes, e.g. during analytical titration assays (doing two similar assays over a short interval of time) is also known as A. Reproducibility B. Repeatability C. Intermediate Precision D. System Precision	B. Repeatability Reproducibility - precision between different laboratories Repeatability - expresses the precision under the same operating conditions over a short interval of time Intermediate Precision - precision within the same laboratory, with variations What are the types of precision studied in validation?  Repeatability Precision under the same operating conditions  Intermediate Precision Precision within the same laboratory, with variations  Reproducibility Precision between different laboratories
66. Potentiometry is a type of visually determined endpoint. Metalochromic Indicators are pH-dependent. A. The first statement is true but the second statement is false. B. The first statement is false but the second statement is true. C. Both statements are true.	B. The first statement is false but the second statement is true. There are two types of endpoint determination in titrimetry: by <i>visual determination</i> and <i>electrometric determination</i>. Potentiometry belongs to the second type, while the use of indicators belongs to the first type.

D. Both statements are false.	Acid-base indicators , as well as metallochromic indicators (used in complexation) are pH dependent.														
67. In direct permanganometry, the analyte is a/an A. Reducing agent B. Oxidizing agent C. Acid D. Base	A. Reducing agent In permanganometry, Mn^{+} is reduced to Mn^{+} and further to Mn^{2+} . Thus, the analyte is being oxidized, which refers to a reducing agent. Titrant - oxidizing agent														
68. Iodimetry and Iodometry assay uses starch as an indicator. Sodium Thiosulfate VS is a titrant in Iodometry. A. The first statement is true but the second statement is false. B. The first statement is false but the second statement is true. C. Both statements are true. D. Both statements are false.	C. Both statements are true. <table><tr><th>Iodimetry</th><th>Iodometry</th></tr><tr><td>Direct</td><td>Indirect</td></tr><tr><td>Iodine</td><td>Sodium thiosulfate</td></tr><tr><td>Arsenic trioxide</td><td>K dichromate</td></tr><tr><td>Starch - START</td><td>Starch - BEFORE reaching endpoint (straw-colored)</td></tr><tr><td>Appearance of blue</td><td>Disappearance of blue</td></tr><tr><td>For RA: Direct: Vit. C, Lugol's Residual: Methionine</td><td>For OA: Direct: $CuSO_4$, $NaOCl$ Residual: Phenol, Resorcinol, SeS_2</td></tr></table> Process of Iodometric Titration  Iodometry is an indirect titration that utilizes KI as a source of Iodine. The analyte is an oxidizing agent, oxidizing I^- (in KI) to I_2. The iodine produced is then titrated with Sodium Thiosulfate VS, converting I_2 back to I^- which reacts with the indicator, Starch TS	Iodimetry	Iodometry	Direct	Indirect	Iodine	Sodium thiosulfate	Arsenic trioxide	K dichromate	Starch - START	Starch - BEFORE reaching endpoint (straw-colored)	Appearance of blue	Disappearance of blue	For RA: Direct: Vit. C, Lugol's Residual: Methionine	For OA: Direct: $CuSO_4$, $NaOCl$ Residual: Phenol, Resorcinol, SeS_2
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69. The indication that the endpoint has been reached in Mohr method is A. Cessation of precipitation B. Pink precipitate C. Yellow turbidity D. Red precipitate	D. Red precipitate <table><tr><th>Method</th><th>Indicator</th><th>Endpoint</th></tr><tr><td>Gay-Lussac</td><td>None (halides)</td><td>Cessation of precipitation</td></tr><tr><td>Liebig</td><td>K_2CrO_4 (cyanide)</td><td>Appearance of turbidity $Ag(CN)_2$</td></tr><tr><td>Mod Leibig</td><td>KI TS</td><td>Appearance of yellow turbidity AgI</td></tr></table>	Method	Indicator	Endpoint	Gay-Lussac	None (halides)	Cessation of precipitation	Liebig	K_2CrO_4 (cyanide)	Appearance of turbidity $Ag(CN)_2$	Mod Leibig	KI TS	Appearance of yellow turbidity AgI		
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	Mohr	K ₂ CrO ₄	Red ppt (Ag ₂ CrO ₄)	
	Volhard	Ferric alum/Ferric ammonium nitrate	Orange tinge color	
	Fajans	Eosin Y, Dichloroflurosien	White to pink colored ppt	
	PRECIPITIMETRY			
	Parameter	Mohr	Fajan's	Volhard
	Type	Direct	Direct	Direct, Residual
	Titrant	AgNO ₃ VS	AgNO ₃ VS	D: NH ₄ SCN VS R: AgNO ₃ , NH ₄ SCN VS
	Analyte	Halides	Halides	D: Hg R: Halides
	Conditions	pH 8 via CaCO ₃	Adsorption Indicators	Acidic in 0.1N HNO ₃
Indicator	K ₂ CrO ₄ (Potassium chromate)	If DCF: pH 4 If Eosin Y: pH 2-3	Ferric ammonium sulfate	
Endpoint	Red ppt	Pink on surface ppt	Orange tinge (supernatant)	
70. In the assay of Maalox for Magnesium content, triethanolamine is used as A. Indicator B. pH adjusting agent C. Masking agent D. It is not used	C. Masking agent Triethanolamine: Masking agent for aluminium ion Indicator - Eriochrome black pH adjusting agent - ammonia-ammonium chloride - Masking agents are used to determine a single metal in the presence of other metals			
Masking agents				
Triethanolamine	Fe, Mn, Al			
Thioglycols	Hg, Cu, Pb, Bi			
Cyanide	Cu, Co, Ni, Zn			
Fluoride	Ca, Mg, Al (MAC Fluorry)			
71. Yellow heat A. 550-700°C B. 800-1000 °C C. 1000-1200 °C D. 1200-1500 °C	C. 1000-1200 °C			
Very dull red heat		500-550°C		
Dull red heat		550-700°C		
Bright red heat		800-1000°C		
Yellow red heat		1000-1200°C		
White heat		1200-1600°C		

72. The length of a complete cycle from 1 peak to the next is called. A. Frequency B. Wavelength C. Amplitude D. Wave number	“VERY Demanding BaYaW” B. Wavelength  Wavelength (λ) Distance between identical points on consecutive waves Amplitude Distance between origin and crest (or trough) Frequency (ν) Number of waves that pass a point per unit time Speed = wavelength x frequency Frequency - # of complete cycles which passes a given point; inverse of wavelength Wavelength - distance between two consecutive, identical points on a wave Amplitude - max height of a wave Wave number - # of waves per given distance
73. “The power of the transmitted energy beam decreases exponentially as the concentration of solution containing the absorbing species increases arithmetically.” This statement refers to A. Beer’s Law B. Lambert’s Law C. Bouger’s Law D. Both B and C	A. Beer’s Law  $A = \epsilon \ell c$ absorbance molar absorptivity path length concentration Lambert's and Bouger's refers to the same law which states: The power of the transmitted energy beam decreases exponentially as the thickness of solution containing the absorbing species increases arithmetically. The combined law is referred to as Beer-Lambert • $A = abc$ where A = absorption, a=molar absorptivity, b=distance, c=concentration 1. Beer's/Bernard Law - Transmittance is inversely proportional to concentration - "CONCENTRATED ang BEER ni BERNARD" 2. Lambert's/ Bougar's Law - Transmittance is inversely proportional to thickness 3. Beer-Lambert Law - Absorbance is directly proportional to concentration
74. Volatile oils are composed of terpenoids that resinify after some time. Fixed oils are composed of fatty acids that turn rancid after some time. A. The first statement is true but the second statement is false.	C. Both statements are true. Volatile oil → Terpenoids → RESINIFIES Fixed oil → Fatty acids/glycerides → RANCID

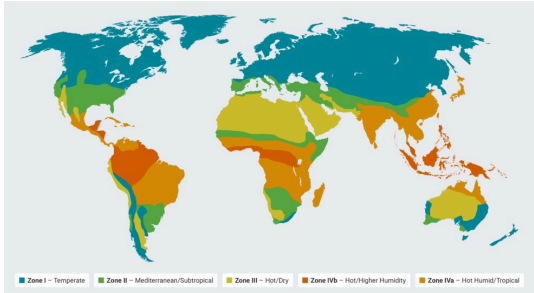
B. The first statement is false but the second statement is true. C. Both statements are true. D. Both statements are false.													
75. Koettsdorfer number is also known as A. Saponification Value B. Acid Value C. Ester Value D. Alcohol Value	A. Saponification value <table><tr><td></td><td>AKA</td><td>Definition</td></tr><tr><td>Acid Value</td><td>acid number and acidity index</td><td>the number of mg of KOH necessary to neutralize the free acids in 1g of sample</td></tr><tr><td>Ester Value</td><td>Ester number</td><td>The number of mg of KOH necessary to saponify the esters in 1 g of sample</td></tr><tr><td>Saponification Value</td><td>Koettsdorfer number</td><td>The number of mg of KOH necessary to neutralize the free acids and saponify the esters contained in 1g of sample</td></tr></table>		AKA	Definition	Acid Value	acid number and acidity index	the number of mg of KOH necessary to neutralize the free acids in 1g of sample	Ester Value	Ester number	The number of mg of KOH necessary to saponify the esters in 1 g of sample	Saponification Value	Koettsdorfer number	The number of mg of KOH necessary to neutralize the free acids and saponify the esters contained in 1g of sample
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76. Which of the following is a drying oil? A. Cottonseed oil B. Linseed oil C. Sesame oil D. Almond oil	B. Linseed oil <table><tr><td>Drying Oil</td><td>Semi-drying</td><td>Non-drying</td></tr><tr><td>> 120 iodine value</td><td>100 – 200</td><td><100</td></tr><tr><td>Linseed, cod liver “Dry ang LiCod”</td><td>Cottonseed, sesame “SeCotSe”</td><td>Olive, Almond, cocoa, lanolin, peanut “NOA”</td></tr></table>	Drying Oil	Semi-drying	Non-drying	> 120 iodine value	100 – 200	<100	Linseed, cod liver “Dry ang LiCod”	Cottonseed, sesame “SeCotSe”	Olive, Almond, cocoa, lanolin, peanut “NOA”			
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Linseed, cod liver “Dry ang LiCod”	Cottonseed, sesame “SeCotSe”	Olive, Almond, cocoa, lanolin, peanut “NOA”											
77. The type of alkaloidal assay wherein the total alkaloids are determined a. Ultimate b. Specific c. Extraction d. Proximate	D. Proximate Assay of crude drugs may be classified according to the manner in which the percent of extractive is determined. Proximate - If the percent of extractive represents the total of a class of plant principles (total alkaloids, glycosides) Ultimate - If the percent extractive represents a single chemical species, for example morphine alkaloid.												
78. What limit test uses diethyldithiocarbamate? a. Nitrogen b. Arsenic c. Zinc d. Antimony	B. Arsenic <table><tr><td>Chemical Impurity</td><td>Reagent Used</td></tr><tr><td>Heavy metals: Zinc, cadmium, manganese and Antimony Sulfides: - Zinc - White - Cadmium - Yellow - Manganese - Pink / Salmon - Antimony - Orange - Lead - Black </td><td>Hydrogen Sulfide</td></tr><tr><td>Iron</td><td>Ammonium thiocyanate</td></tr></table>	Chemical Impurity	Reagent Used	Heavy metals: Zinc, cadmium, manganese and Antimony Sulfides: - Zinc - White - Cadmium - Yellow - Manganese - Pink / Salmon - Antimony - Orange - Lead - Black	Hydrogen Sulfide	Iron	Ammonium thiocyanate						
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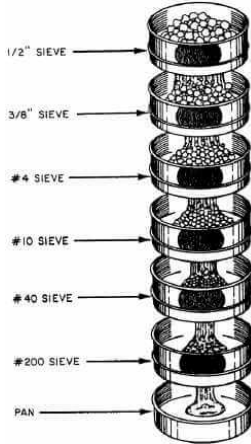
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Arsenic	Silver diethyldithiocarbamate								
Chlorides	Silver nitrate								
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79. The desired hardness for Isordil is a. 2-3 kg b. 7-10 kg c. 4-10 kg d. 5-8 kg	A. 2-3 kg Isordil (isosorbide dinitrate, used for angina) is a sublingual tablet Hardness specification: 2 - 3 kg - sublingual and chewable tablets 7 - 10 kg - buccal tablets 4 - 10 kg - Immediate release oral tablets								
80. Tests for pyrogens make use of chickens. It involves injection in the eye vein. a. The first statement is true but the second statement is false. b. The first statement is false but the second statement is true. c. Both statements are true. d. Both statements are false.	D. Both statements are false Test for pyrogens involves the use of rabbits with injection in the ear vein = of about 10ml solution per kg of body weight. Temperature rise is measured for 1 to 3 hours at 30 minute intervals. Acceptance criteria - 3 rabbits, individual rise in temperature is nmt 0.5°C; if fail, add 5 more rabbits, and new acceptance criteria is mt 3 rabbits have an individual rise of 0.5°C and total rise is nmt 3.3°C <table> <tr> <th colspan="2">Rabbit Test (In Vivo)</th></tr> <tr> <td>Prior Test</td><td>Samples: 3 healthy, mature rabbits (37 ± 0.2 deg C) Apparatus: Depyrogenated at 250 deg C</td></tr> <tr> <td>During Test</td><td>Inj. 10 mL/kg TS in the ear vein, completing inj. within 10 mins after start of administration After 1 hour, record the rectal temperature (30 mins/ 1 h intervals for 3 hours)</td></tr> <tr> <td>AC (Non-pyrogenic)</td><td>Sum rise: AC 1: < 1.5 deg C for 3 rabbits (provided no individual rise of ≥ 0.5 deg C *if 1 rabbit ≥ 0.5 deg C + 5 rabbits AC 2: ≤ 3.3 deg C for 8 rabbits (provided NMt 3 rabbits have individual rise of ≥ 0.5 deg C)</td></tr> </table>	Rabbit Test (In Vivo)		Prior Test	Samples: 3 healthy, mature rabbits (37 ± 0.2 deg C) Apparatus: Depyrogenated at 250 deg C	During Test	Inj. 10 mL/kg TS in the ear vein, completing inj. within 10 mins after start of administration After 1 hour, record the rectal temperature (30 mins/ 1 h intervals for 3 hours)	AC (Non-pyrogenic)	Sum rise: AC 1: < 1.5 deg C for 3 rabbits (provided no individual rise of ≥ 0.5 deg C *if 1 rabbit ≥ 0.5 deg C + 5 rabbits AC 2: ≤ 3.3 deg C for 8 rabbits (provided NMt 3 rabbits have individual rise of ≥ 0.5 deg C)
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AC (Non-pyrogenic)	Sum rise: AC 1: < 1.5 deg C for 3 rabbits (provided no individual rise of ≥ 0.5 deg C *if 1 rabbit ≥ 0.5 deg C + 5 rabbits AC 2: ≤ 3.3 deg C for 8 rabbits (provided NMt 3 rabbits have individual rise of ≥ 0.5 deg C)								
81. What is the indicator used in cerimetry? a. Ferroin b. Orthophenanthroline c. Both A and B d. None of these	C. Both A and B Ferroin is also called as orthophenanthroline (OA) $Ce^{4+} + RA \rightarrow Ce^{4+}$								

	At endpoint, slight excess of Ce^{4+} $\text{Ce}^{4+} + \text{Fe}^{2+} \rightarrow \text{Ce}^{3+} + \text{Fe}^{3+}$ Ferrous complex (red) to ferric complex (blue)														
Nos. 82-84. Disintegration data of Paracetamol tablet <table border="1"> <thead> <tr> <th>Tablet #</th><th>Time when tab disintegrate</th></tr> </thead> <tbody> <tr><td>1</td><td>405"</td></tr> <tr><td>2</td><td>480"</td></tr> <tr><td>3</td><td>436"</td></tr> <tr><td>4</td><td>442"</td></tr> <tr><td>5</td><td>561"</td></tr> <tr><td>6</td><td>509"</td></tr> </tbody> </table> Specification: NMT15 minutes in water 82. Determine the average time the tablet disintegrates 7'22" 7'52" 8'00" 8'05"	Tablet #	Time when tab disintegrate	1	405"	2	480"	3	436"	4	442"	5	561"	6	509"	B. 7'52" $\frac{2,833}{60 \text{ seconds}} = 47.21 \text{ seconds}$ $\frac{427.17 \text{ seconds}}{60 \text{ seconds}} = 7.12 = 7 \text{ minutes}$ $0.12 + 60 \text{ seconds} = 52 \text{ seconds}$ $= 7 \text{ minutes and } 52 \text{ seconds}$
Tablet #	Time when tab disintegrate														
1	405"														
2	480"														
3	436"														
4	442"														
5	561"														
6	509"														
83. Determine the time the last tablet disintegrates 6'45" 8'53" 8'28" 9'21"	D. 9'21" $\frac{561}{60 \text{ seconds}} = 9.35 = 9 \text{ minutes}$ $0.35 \times 60 \text{ seconds} = 21 \text{ seconds}$ $= 9 \text{ minutes and } 21 \text{ seconds}$ <i>*The time the last tablet (meaning pinaka matagal so 561 kasi mas matagal si 561 kesa kay 509)</i>														
84. Disposition on the tablet tested - Passed - Rejected - Cannot be determined - None of the above	A. Passed														
85. Three batches of tablets are undergoing real time stability study. How many times would the tablets have been tested after 1 year of study? 3 4 5 6	C. 5														
86. Caraway oil was assayed for its volatile oils content by bisulfite method. Most probably, the volatile oil content of caraway oil is a - Ketone - Ester - Alcohol - Phenol	A. Ketone Aldehyde/ketone content Bisulfite method - formation of additional products which are soluble in water, separates the total aldehydes/ketones from the														

	nonaldehyde components, which are water insoluble. It is then measured using a cassia flask. Hydroxylamine method - liberates HCl upon reaction with aldehyde or ketone, which is titrated with 1N NaOH Phenol Content - readily soluble upon addition of alkali (NaOH). Cassia Flask is used for determination (measure s the water soluble component) Ester content - # of mg of KOH required to saponify 1g of oil NOTE: Cassia flask is flask with graduations, used to measure the amount of water soluble from non water soluble products ANOTHER NOTE: Carvone is the principal volatile oil in caraway oil (a ketone). <table><tr><th colspan="2">Assay of Volatile Oil</th></tr><tr><td>Alcohol</td><td>Acetylation method Ex: Peppermint</td></tr><tr><td>Aldehyde and Ketone</td><td>Bisulfite (Cassia) Hydroxylamine (Titration) Ex: Cinnamon oil</td></tr><tr><td>Phenol</td><td>KOH (Cassia)</td></tr><tr><td>Volatile oil in spirit</td><td>Babcock bottle</td></tr></table>	Assay of Volatile Oil		Alcohol	Acetylation method Ex: Peppermint	Aldehyde and Ketone	Bisulfite (Cassia) Hydroxylamine (Titration) Ex: Cinnamon oil	Phenol	KOH (Cassia)	Volatile oil in spirit	Babcock bottle
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87. Which of the following uses a cassia flask? a. Aldehyde content determination (bisulfite) b. Ketone content determination (bisulfite) c. Phenol content d. All of the above	D. All of the above Refer to no. 86										
88. Fajan method indicator a. Dithizone b. Eosin Y c. Eriochrome Black d. All of the above	B. Eosin Y Complexometry Indicators: ● Dithizone - Al, Bi ● Eosin Y - aka tetrabromofluorescein ● Eriochrome Black - Mg, Zn										
89. Accelerated stability study temperature for Glargine? A. 5°C + 3°C B. 25°C + 2 °C C. 40 °C + 2 °C D. -20 °C + 5 °C	B. 25 °C + 2 °C Note: Glargine is an insulin preparation, stored in refrigerator Drug Products intended for storage in a refrigerator: <table><tr><th>Study</th><th>Storage Conditions</th><th>Minimum time Period Covered by Data at Submission</th></tr><tr><td>Real Time</td><td>5C ± 3C</td><td>12 months</td></tr></table>	Study	Storage Conditions	Minimum time Period Covered by Data at Submission	Real Time	5C ± 3C	12 months				
Study	Storage Conditions	Minimum time Period Covered by Data at Submission									
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	Accelerated	25C ± 2C / 60% RH ± 5% RH	6 months									
90. Significant change, according to ASEAN Stability guidelines A. 10% change in assay from initial value or failure to meet acceptance criteria B. Any degradation product exceeds acceptance criteria C. Physical changes in accelerated conditions, such as softening of suppositories D. all of the above	B. Any degradation product exceeds acceptance criteria In general, "significant change" for a drug product is defined as: 1. A 5% change in assay from its initial value, or failure to meet the criteria 2. Any degradation product exceeding the acceptance criterion; 3. Failure to meet the acceptance criteria for appearance, physical attributes, and functionality tests (e.g. colour, phase separation, resuspendability, caking, hardness, dose delivery per actuation); however, some changes in physical attributes (e.g., softening of suppositories, melting of creams) may be expected under accelerated conditions and as appropriate for the dosage form. 4. Failure to meet the acceptance criteria for pH; 5. Failure to meet the acceptance criteria for dissolution for 12 dosage units or tablet).											
91. Reasons why residual titration is performed, except A. Reaction proceeds slowly B. Sample is volatile C. Poor solubility of sample D. None of these	D. None of these Residual titration is performed because the reaction proceeds slowly, the sample is volatile, or has poor solubility.											
92. What solution is employed in the conduct of leakers test for vials/ampoules A. 1% Methylene blue B. 1% Methylene chloride C. 10% Methylene blue D. 10% Methylene chloride	A. 1% Methylene blue 1% Methylene blue solution is employed in the conduct of leakers test for sealed vials/ ampoules, to determine any crack/possible leaking of contents/external contamination.											
93. Drying to constant weight has occurred when two consecutive weighing that do not differ by more than A. 0.0002 g B. 0.2 mg C. 0.5 mg/g D. All of the above	D. All of the above 0.5mg/g - USP 0.0002g = 0.2mg - Jenkins											
94. Philippines belong to climatic zone A. I B. II C. III D. IV	D. IV <table><tr><th>Climatic Zone</th><th>Types of Climate</th><th>Temperature / Relative Humidity</th></tr><tr><td>Zone I (Canada, Germany, Russia)</td><td>Temperate</td><td>21 °C + 2 °C and 45 + 5% RH</td></tr><tr><td>Zone II (USA, Japan, Italy, France, Australia)</td><td>Mediterranean / Subtropical</td><td>25 °C + 2 °C and 60 + 5% RH</td></tr></table>			Climatic Zone	Types of Climate	Temperature / Relative Humidity	Zone I (Canada, Germany, Russia)	Temperate	21 °C + 2 °C and 45 + 5% RH	Zone II (USA, Japan, Italy, France, Australia)	Mediterranean / Subtropical	25 °C + 2 °C and 60 + 5% RH
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	Zone III (Iraq, Jordan)	Hot and Dry (try)	30 +2°C and 35 + 5% RH
	Zone IV-A (UAE, Saudi Arabia)	Hot and humid	30 °C + 2 °C and 65 + 5% RH
	Zone IV-B (Philippines and other ASEAN countries)	Hot and very humid	30 °C + 2 °C and 75 + 5% RH
			
95.The temperature used for ignition to constant weight is Question 95 Answer	B. 800C +- 25C Crucial Distinction: USP <733> vs. <281> <733> Loss on ignition: 800°C + 25°C - ensure all volatile matter are driven off (nawala na volatile oil) <281> Residue on ignition: 600°C + 50°C - sulfated ash (natirang ash)		
96.Speed of Roche Friabilator	A. 25 rpm The prescribed speed of a Roche Friabilator is 25rpm for the test for friability (4 mins) 		
97.Antibiotic microbial assay/s recognized by the USP	A. Plate Method Two methods are recognized by the USP as official antibiotic microbial assay, "plate" or cylinder plate method and "tube" or turbidimetric method. a. Plate method depends upon diffusion of antibiotic from a vertical cylinder through a solidified agar layer in a petri dish; zone of inhibition is observed b. Turbidimetric method - depends upon the inhibition of growth of microbial culture in a uniform solution of the antibiotic in a fluid medium that is favourable to its rapid growth in the absence of the antibiotic.		
98.Sieve Analysis	A. 24.375 g		

A granulation sample weighing 75 g is being passed through a series of sieve mesh sizes. The record indicates that 32.5% was retained on mesh #40, 12.5% on mesh #50, 6.5% on mesh #80, 23.7% on mesh #100, and half of the remaining granules was retained on mesh #200. Based on the data, determine the following: Compute for the amount of granules retained on mesh #40. A. 24.375 g B. 33.750 g C. 50.625 g D. None of the above	Sample = 75g Retained %: #40 = 32.5% #50 = 12.5% #80 = 6.5% #100 = 23.7% #200 = half of remaining 32.5% x 75g = 24.375g																																						
99.Determine the amount of granules which passed through mesh #200. A. 9.300 g B. 17.775 g C. 18.600 g D. 27.075 g	A. 9.300 g #40 = 32.5% #50 = 12.5% #80 = 6.5% #100 = 23.7% = 75.2% 100% - 75.2 % = 24.8% half of remaining: 24.8% / 2 = 12.4% 12.4% x 75g = 9.300g 																																						
100. Compute for the amount of granules which passed through mesh #40 but not through mesh #80. A. 38.625 g B. 33.750 g C. 14.250 g D. 9.375 g	E. 14.250 g 12.5% + 6.5% = 19% 19% x 75g = 14.25g <table><tr><th>Set-up</th><th>Data</th><th>100 %</th><th></th><th>75.000 g</th><th></th></tr><tr><td>Mesh #40</td><td>32.5 %</td><td rowspan="3">} 75.2 %</td><td>32.5 %</td><td>(no. 98) 24.375 g</td><td></td></tr><tr><td>Mesh #50</td><td>12.5 %</td><td>12.5 %</td><td>9.375 g</td><td>(no. 100)</td></tr><tr><td>Mesh #80</td><td>6.5 %</td><td>6.5 %</td><td>4.875 g</td><td>} 14.25 g</td></tr><tr><td>Mesh #100</td><td>23.7 %</td><td rowspan="3">} 24.8 %</td><td>23.7 %</td><td>17.775 g</td><td></td></tr><tr><td>Mesh #200</td><td>Half of remaining</td><td>12.4 %</td><td>9.300 g</td><td></td></tr><tr><td>Receiver</td><td></td><td>12.4 %</td><td>(no. 99) 9.300 g</td><td></td></tr></table>	Set-up	Data	100 %		75.000 g		Mesh #40	32.5 %	} 75.2 %	32.5 %	(no. 98) 24.375 g		Mesh #50	12.5 %	12.5 %	9.375 g	(no. 100)	Mesh #80	6.5 %	6.5 %	4.875 g	} 14.25 g	Mesh #100	23.7 %	} 24.8 %	23.7 %	17.775 g		Mesh #200	Half of remaining	12.4 %	9.300 g		Receiver		12.4 %	(no. 99) 9.300 g	
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The journey is as essential as the destination.

Congratulations, future RPh! <3