BIOD 171 FINAL EXAM

written by

ACEMYWORK

1. True or False: A virus is considered a microorganism.

False. Viruses are not living and as such are not considered microorganisms. Viruses can, however, be classified as microbes, a more general term that includes microorganisms and viruses.

2. What is the smallest biological unit of life?

A cell.

3. At a generalized level, all cells are comprised of what?

Macromolecules*
***A student may also answer: Proteins, Lipids, Nucleic acids and Polysaccharides but they must answer with all four to be fully correct.**

1. Animalia, Plantae, Fungi and Protista are all classification under what type of organism?

A. Bacteria
B. Eukarya
C. Archaea
D. Virus

B. Only Eukarya contains animals, plants, fungi and protists.

2. All multicellular microorganisms classified as Animalia are autotropic.

False—they are heterotropic.

3. Microorganisms classified as_____obtain most of their energy by converting light energy into chemical energy.

Plantae

1. Define catabolism.

Catabolism is the process of breaking down larger molecules into useful energy sources.

2. Upon cellular injury, which metabolic process is involved during the growth and repair phases of the cell?

The anabolic process would be active as it (by definition) is involved in the building up of small complexes into larger complexes.

1. In phosphorylation, the light reactions always occur where?

The process of converting light energy into chemical energy (photophosphorylation) always occurs in the membrane.

2. True or False: The Calvin cycle must occur in the absence of light.

False. The term 'dark reactions' (also known as the Calvin Cycle) simply denotes the second stage in photosynthesis—dark reactions do not actually require darkness in order to occur.

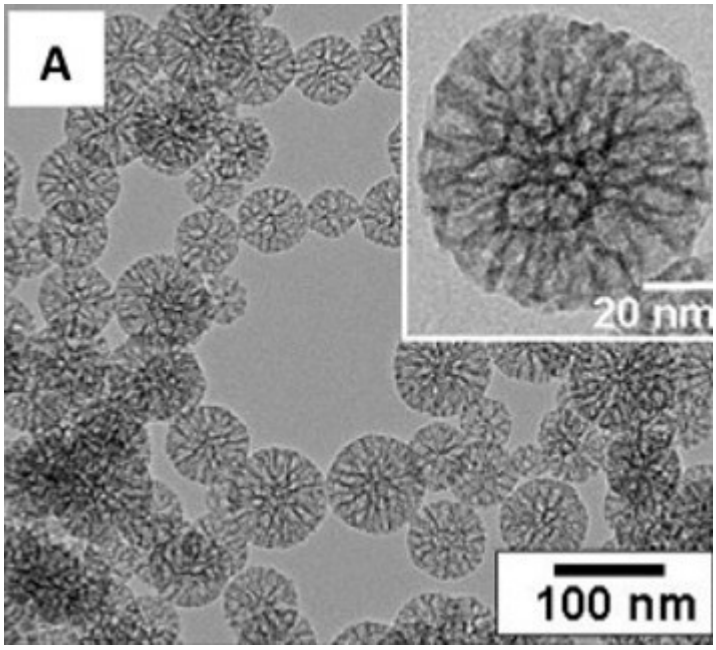
1. Assuming a constant (non-adjustable) light source power, identify the part of the microscope you would adjust to limit the amount of light entering the microscope. Select all that apply.
A. Objective
B. Condenser
C. Iris diaphragm
D. Eye piece

C. The iris controls the amount of light that passes through the sample and into the objective lens. Thus, it can be adjusted (opened or closed) to alter the amount of light.

2. What is the total magnification (relative to your eye) of a sample imaged with a 60x objective and a 10x eyepiece? Show your math.

60 x 10 = 600x magnification

1. Identify what type of electron microscope was used to capture the following image and explain your choice.



The above image is captured via a Transmission Electron Microscope (TEM). Even at 20nm resolution (inset image), subcellular substructures are still visible. The image lacks the outside 'shell' only appearance of SEM.

1. True or False: LB agar is classified as a selective, non-differential media.

False. LB agar is the most basic type of agar and like LB media supports the growth of virtually all microbes without restriction.

2. What is agar used for in microbiology?

Agar is used to create a solid, smooth surface on which microbes can grow.

1. True or False. When performing a dilution streak a new (or sterilized) loop is not required for each phase as long as the bacterial culture is pure.

False. A new or sterilized loop is absolutely required for each phase. Failure to do so would prevent the establishment of a dilution gradient, as the same bacterial concentration would be spread across both phase regions, regardless of whether or not the culture is pure.

2. The number of phases (3 vs. 4) and/or the number of times a loop passes through a previous phase (once vs. multiple times) is acceptable provided what happens?

Either deviation is acceptable in practice provided the resulting gradient contains within it

the growth of individual colonies—if not, the experiment must be repeated.

3. True or False. Pathogenic strains of bacteria tend to grow slower than normal non-pathogenic bacterial strains.

False. Pathogenic strains of bacteria tend to grow faster than non-pathogenic strains at 37°C, which is why researchers may set incubators at 25°C to restrict its growth.

1. Match the following symptoms with their respective diseases:

1. Childhood skin disease near mouth/nose
C A. Folliculitis

2. Infection of thin, transparent scleral tissue
D B. Scalded-skin syndrome

3. Infection occurs at time of birth
E C. Impetigo

4. Pus-filled lesions on skin or hair
A D. Conjunctivitis

5. Ruptured pustules; treated with Penicillin
B E. Ophthalmia Neonatorum

2. True or False. Staphylococcus is the only causative agent of conjunctivitis.

False. There are bacterial (staph) and viral forms of conjunctivitis, both resulting in the inflammation of the conjunctiva and 'pink eye.'

1. True or False. There are currently no cures for tetanus.

True. Although the symptoms can be treated it is only to manage the discomfort not to cure.

2. Identify the medical condition characterized by robust carbohydrate fermentation under anaerobic conditions, swelling of the infected areas and fever.

Gas gangrene. The key identifier here is the robust carbohydrate fermentation, which manifests as intense gas production and swelling—both trademark conditions of gas gangrene.

3. The alpha-toxin perfringolysin is associated with which medical condition caused by Gram-positive anaerobic bacteria?

A. Tetanus
B. Botulism
C. Gas gangrene
D. Leprosy

C. Gas gangrene. The bacterium that produces the alpha toxin perfringolysin is aptly named Clostridium perfringens.

1. The_____surrounds the capsid of some viruses.

Envelope.

2. True or False. You would expect to see a viral envelope on a virus infecting a plant cell.

False. The overwhelming majority of animal viruses are enveloped whereas the majority of plant or bacteria-infecting viruses are not.

3. Rank the following viruses based on their size from largest to smallest: Orthomyxovirus
Poliovirus
Variolavir
us

Variolavirus (~200nm) > Orthomyxovirus (100-150nm) > Poliovirus (~30nm)

1. What linear, double-stranded, enveloped DNA virus is the first virus (as of Oct. 26, 1977) to be officially declared eradicated?

Smallpox (Variola virus). Although once a major cause of death in the world, a smallpox vaccine was developed in 1796 by Edward Jenner. Global vaccination efforts have prevented smallpox from appearing in humans since October 26, 1977, making smallpox the first infectious disease ever to be eradicated.

2. What small (~30nm) single-stranded, non-enveloped RNA virus targets the CNS (central nervous system), causing potentially catastrophic damage to motor neurons?

Polio, also known as poliomyelitis.

3. By whom and where was the first Polio vaccine developed?

Jonas Salk and his research team developed the polio vaccine at the University of Pittsburgh in 1955.

4. Which subtype of Influenza is the most virulent?

Influenza A.