

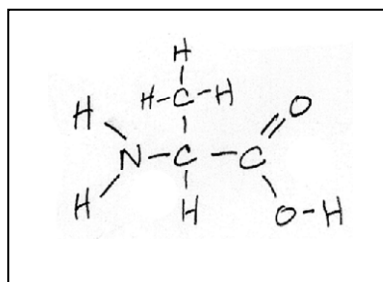
BIOL 1114– Introduction to Biology
Exam 1 – Spring 2023 -- Prof. Laroui

Instructions:

- Scantron answer bubbles should be completely filled in with a number 2 pencil.
- Start by filling in your complete last name and both first and middle name initials.
- Choose THE BEST answer.
- Please do not turn this page over until your Dr Yuang has instructed you to do so.

1. Which of the following is/are properties of life?
 - A) cellular organization
 - B) DNA
 - C) the ability to take in energy and molecules and use them (metabolism)
 - D) the ability to reproduce
 - E) All of the choices above are correct.
2. Generally speaking, there are just two types of cells on Earth, these are
 - A) prokaryotic and Archaic cells
 - B) prokaryotic and eukaryotic cells
 - C) Plant and animal cells
 - D) big and small cells
3. Organisms belonging to the plant kingdom
 - A) are usually photosynthetic.
 - B) contain cells that are surrounded by cell walls.
 - C) are all unicellular.
 - D) lack a nucleus.
 - E) are usually photosynthetic and contain cells that are surrounded by cell walls.
4. In Eukaryote cells, two organelles are called peroxisomes and lysosomes. what are their main purpose inside the cell:
 - A) DNA replication
 - B) Proteins synthesis
 - C) Cell division
 - D) electron transfert chain
 - E) Cell defense and old organelles recycling.
5. When we eat, digest, we use high energy from bonds C-C, C-O, and C-H rich in electrons. A(n) _____ forms when two atoms share electrons.
 - A) ion
 - B) element
 - C) covalent bond
 - D) ionic bond
 - E) hydrogen bond
6. _____ are weak bonds that are not strong enough to hold atoms together to form molecules, but are strong enough to form bridges between molecules.
 - A) Ionic bonds
 - B) Covalent bonds
 - C) Hydrogen bonds

8. In salad dressings, oil quickly separates from vinegar (which is mostly water) because oils
- are hydrophobic.
 - are polar.
 - are lipids.
 - are both A and B.
 - are both A and C.
9. Small insects are able to walk on water because of the cohesion of neighboring water molecules. This cohesion is caused by
- Hydrogen bonding.
 - Ionic bonding.
 - Covalent bonding.
10. In the equation $2 \text{H}_2 + \text{O}_2 \rightarrow 2 \text{H}_2\text{O}$, the H_2 molecules are _____ and the H_2O molecules are _____.
- reactants . . . products
 - products . . . reactants
 - reactants . . . reactants
 - products . . . products
11. In a reaction using an Enzyme, at the end of the reaction, the enzyme is...:
- totally destroyed and will go to recycle
 - only partially destroyed but can still be used.
 - regenerated so ready to be used again
 - attached to the substrate and this bond cannot be broken.
12. Organic compounds
- always contain nitrogen.
 - are synthesized by only animal cells.
 - always contain carbon.
 - always contain oxygen.
13. The molecule below at right is a(n)
- carbohydrate
 - protein
 - amino acid



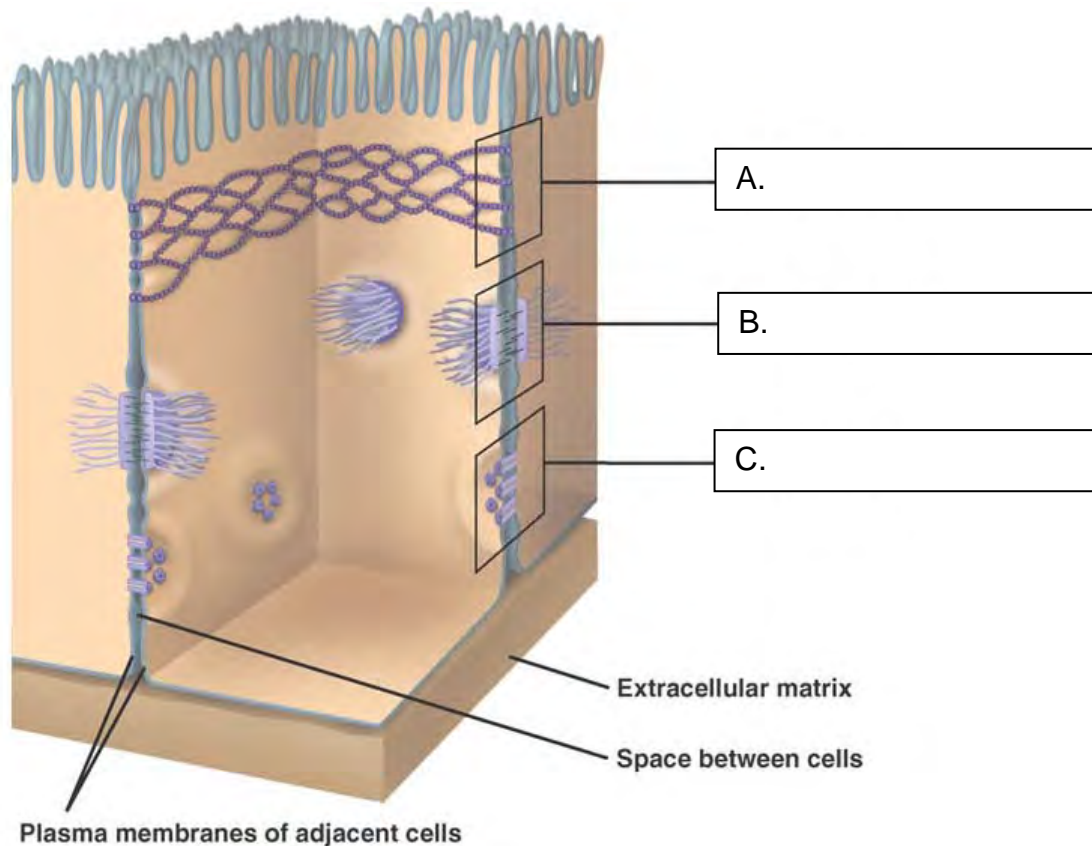
14. Cells typically make all of their macromolecules from a set of 40-50 common monomers and a few other rare ingredients via dehydration (or condensation) reactions. Which of the following statements is/are *true* about dehydration reactions?
- A) One monomer loses a hydrogen atom, and the other loses a hydroxyl (-OH) group.
 - B) Electrons are shared between atoms of the joined monomers.
 - C) H₂O is formed as the monomers are joined.
 - D) Covalent bonds are formed between the monomers.
 - E) All of the choices are correct.
15. The results of a dehydration (condensation) reaction can be reversed by
- A) hydrolysis.
 - B) polymerization.
 - C) the addition of an amino group.
16. Triglycerides are a combination of these two molecules.
- A) oils and sugar
 - B) fatty acids and glycerol
 - C) amino acids and sugar
 - D) amino acids and fatty acids
17. During the process of _____ molecules move across the plasma membrane from high to low concentration.
- A) active transport
 - B) endocytosis
 - C) osmosis
 - D) diffusion
18. Lysosomes
- A) help to digest worn-out or damaged organelles.
 - B) recycle materials within the cell.
 - C) fuse with food vacuoles to expose nutrients to lysosomal enzymes.
 - D) destroy harmful bacteria engulfed by white blood cells.
 - E) All of the choices are correct.
19. Which of the following statements about enzymes is true?
- A) All biochemical reactions require enzymes.
 - B) Enzymes are molecules that lower the activation energy of a reaction.
 - C) Enzymes are molecules that produce nucleotide.
 - D) Enzymes are molecules that help with homeostasis.
20. Osmosis is
- A) The net flow of water across a membrane from low to high water concentration.
 - B) The diffusion of any substance.
 - C) The diffusion of osmium-tetroxide.
 - D) The diffusion of water.

21. Which type of transmembrane transport requires the expenditure of ATP?
- A) Passive Transport.
 - B) Active Transport.
 - C) Osmosis.
 - D) Diffusion.
22. Most of a cell's enzymes are
- A) RNA molecules.
 - B) proteins.
 - C) amino acids.
 - D) nucleic acids.
 - E) carbohydrates.
23. What process makes bread dough rise?
- A) glycolysis
 - B) oxidative phosphorylation
 - C) cellular metabolism
 - D) fermentation
24. Which one of the following is *false*?
- A) An enzyme's function depends on its three-dimensional shape.
 - B) Enzymes are very specific for certain substrates.
 - C) Enzymes are used up in chemical reactions.
 - D) Enzymes emerge unchanged from the reactions they catalyze.
 - E) An enzyme binds to its substrate at the enzyme's active site.
25. A child is brought to the hospital with a fever of 107°F. Doctors immediately order an ice bath to lower the child's temperature. Which explanation offers the most logical reason for this action?
- A) Elevated body temperature will cause the release of toxins in the blood.
 - B) Too high a body temperature may compromise the 3D structure of (even denature) enzymes, thereby interfering with normal life-sustaining activities of cells.
26. Which of the following can affect the rate of an enzyme-catalyzed reaction?
- A) temperature
 - B) pH
 - C) competitive inhibitors
 - D) noncompetitive inhibitors
 - E) All of the choices are correct.
27. Plasma membranes are selectively permeable. This means that
- A) anything can pass into or out of a cell.
 - B) the plasma membrane allows some substances to enter or leave a cell more easily than others.
 - C) glucose cannot enter the cell.
 - D) plasma membranes must be very thick.

28. Prokaryotes are classified into
- Domain Monera and Domain Archaea.
 - Kingdom Bacteria and Kingdom Archaea.
 - Domain Bacteria and Domain Archaea.
 - Kingdom Protista and Kingdom Monera.
 - Domain Bacteria and Domain Monera.
29. Where in the eukaryotic cells does photosynthesis occur?
- Golgi body
 - Mitochondrion
 - Chloroplast
 - Nucleus
30. Rank the following levels of biological organization for animals, from largest to smallest:
- populations, communities, tissue, organelles, cells
 - communities, populations, tissue, organs, organelles
 - communities, populations, organs, tissues, cells
 - populations, communities, organs, tissues, cells
31. Order the following taxonomic ranks from most inclusive (left most) to least inclusive (right most)
- genus, species, domain, kingdom, order, class
 - species, genus, family, order, class, kingdom, domain
 - species, genus, order, family, class, kingdom, domain
 - domain, kingdom, order, family, class, genus, species
 - domain, kingdom, class, order, family, genus, species
32. Of the three domains, Archaea, Bacteria, and Eukarya, which are thought to be the most closely related two based on genetic evidence?
- Bacteria and Archaea
 - Archaea and Eukarya
 - Bacteria and Eukarya
33. Which of the following domains include almost entirely unicellular organisms?
- Bacteria and Archaea
 - Archaea and Eukarya
 - Bacteria and Eukarya
34. Which of the following domains include the large multicellular plant, animal, and fungal kingdoms?
- Archaea
 - Bacteria
 - Eukarya
35. What is the role of the Golgi Apparatus?
- DNA / gene replication.
 - Polypeptide synthesis.
 - protein packaging and shipping.

36. What is the role of the ribosome?
- DNA / gene replication.
 - Polypeptide synthesis.
 - protein packaging and shipping.
37. For a given element (example Cu^+), an oxydation reaction is :
- a proton gain
 - a neutron loss
 - a electron loss
 - a electron gain
38. Which of the following statements best represents the process of cellular respiration?
- Glucose and oxygen yield carbon dioxide, water and energy.
 - Glucose and carbon dioxide yield water and energy.
 - Glucose and water yield carbon dioxide and no energy.
 - Glucose and oxygen yield carbon dioxide, water and no energy.
39. The 4 major classes of biological molecules include:
- organics, inorganics, gaseous, non-gaseous
 - carbohydrates, saccharides, lipids, proteins
 - carbohydrates, lipids, proteins, amino acids
 - carbohydrates, lipids, proteins, nucleic acids
 - none of the above.
40. A scientific theory is _____.
- a description of the behavior of an aspect of nature under specific circumstances
 - an explanation presented in a mathematical formula
 - a well-tested explanation for a set of observations
 - a tentative explanation for an observation
41. An important component of the cytoskeleton are....
- microarrays
 - microfibers
 - microfilaments
 - microcosms
42. Wine-making professionals always place "pressure valves" on the fermentation reactors to prevent explosion from:
- The formation of ATP.
 - The formation of CO_2 .
 - The Formation of O_2 .
 - No gas are formed during fermentation, that valve is useless.

For the next three questions (43-45), refer to the diagram below:



43. Which of the letters above (A, B, or C) point to the so-called gap-junctions that provide for cytoplasmic connections between cells?
- A.
 - B.
 - C.
44. Which of the following above (A, B, or C) seal off the lining of your digestive track from your interior body cavities, thereby preventing leakage of intestinal acids into body cavities?
- A.
 - B.
 - C.
45. The cell-cell junctions that seal off the lining of your digestive track from your interior body cavities, for example, are called....
- A. Tight junctions
 - B. Anchoring junctions
 - C. Plasmodesmata

46. If you rest in a bath tub of just water for a couple of hours, would your skin be expected to absorb or lose cellular water content?
A. Lose B. Gain
47. Phospholipids are characterized by the following:
A. polar phosphate-containing headgroups and non-polar fatty-acid tails.
B. non-polar phosphate-containing headgroups and non-polar fatty-acid tails.
C. non-polar phosphate-containing headgroups and polar fatty-acid tails.
D. polar phosphate-containing headgroups and polar fatty-acid tails.
48. Which of the following molecules are not typically embedded between neighboring phospholipids of cellular membranes?
A. Cholesterol
B. Transport proteins
C. Proteins
D. nucleic acids
E. glycoproteins
49. Which of the following **is not considered** a plant organ by plant scientists?
A. Leaf
B. Stem
C. Root
D. Chloroplast
50. Is the transmission electron micrograph below a plant or an animal cell?
A. Plant B. Animal

