**Test:** A&P Summer Assignment

**Name:** _____

## Question 1 of 55

All protein building occurs through two principal steps, which are

- **A)** Active transport and passive transport.
- **B)** Osmosis and diffusion.
- **C)** Mitosis and meiosis.
- **D)** Transcription and translation.

## Question 2 of 55

Which organelle contains genomic DNA?

- **A)** Ribosome
- **B)** Nucleus
- **C)** Mitochondria
- **D)** Peroxisome

## Question 3 of 55

Which is the best description for cellular respiration?

- **A)** Cellular respiration is a series of processes that take place within a cell to break down glucose to make ATP.
- **B)** Cellular respiration is the process of breaking down damaged cells and building new cells to replace them.
- **C)** Cellular respiration is the process of moving substances across the plasma membrane.
- **D)** Cellular respiration uses osmosis, diffusion, and filtration to conduct various cellular activities.

## Question 4 of 55

All of the following are true of ribosomes *except*

- **A)** They are primarily involved in the process of diffusion.
- **B)** They can float freely in the cytosol.
- **C)** They are small organelles contained in cells.
- **D)** They contain more than 50 proteins.

## Question 5 of 55

When the cell needs to move molecules from an area of low concentration to one of high concentration, it uses specialized channels or carriers in the cell membrane. This process expends energy and is called

- **A)** Passive transport.
- **B)** Replication.
- **C)** Mitosis.
- **D)** Active transport.

## Question 6 of 55

Diffusion of water across a cell's plasma membrane is called

- **A)** Osmosis.
- **B)** Mitosis.
- **C)** Meiosis.
- **D)** Cytokinesis.

## Question 7 of 55

Which of the following explains why the phospholipid molecules of the plasma membrane arrange themselves with the heads facing outward toward the cytosol and extracellular fluid and the tails facing inward toward each other?

- **A)** The head is hydrophilic, and the tails are hydrophobic.
- **B)** The head is hydrophobic, and the tails are hydrophilic.
- **C)** This arrangement creates a fully permeable barrier to let various materials pass in and out of the cell.
- **D)** This arrangement blocks all materials from passing in and out of the cell.

## Question 8 of 55

The assembly of the protein's amino acid chain occurs in the _____ and is facilitated by _____.

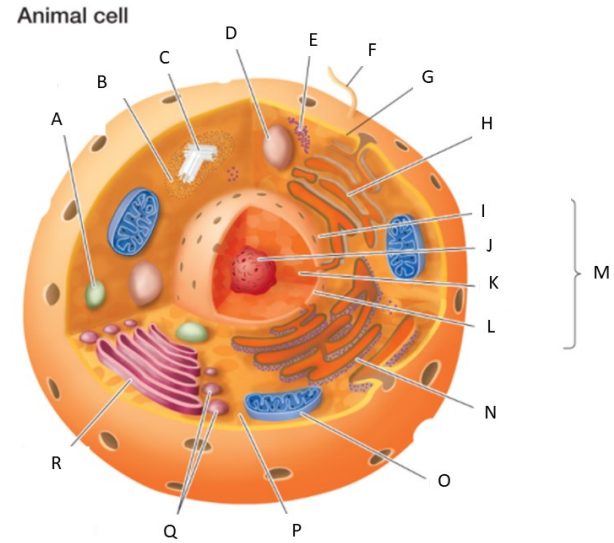
- **A)** Nucleus, ribosomes
- **B)** Nucleus, cytoplasm
- **C)** Cytoplasm, ribosomes
- **D)** Ribosomes, cytoplasm

## Question 9 of 55

Which is a network of protein filaments that extend throughout the cytoplasm?

- **A)** Centromere
- **B)** Cytoskeleton
- **C)** Golgi Complex
- **D)** Nucleolus

## Question 10 of 55




Identify an organelle that produces the most ATP during respiration.

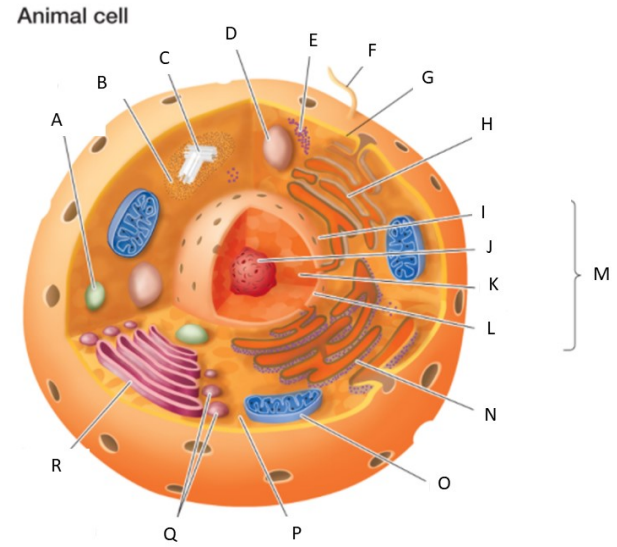
- **A)** C
- **B)** M
- **C)** O
- **D)** H

## Question 11 of 55

When things move from areas of high concentration to low concentration it increases _____. A cell can use this spontaneous reaction to get energy, for example, during _____.

- **A)** Homeostasis; Transcription
- **B)** Damage; Pyruvate Oxidation
- **C)** Entropy; Oxidative Phosphorylation
- **D)** Respiration, Cytokinesis

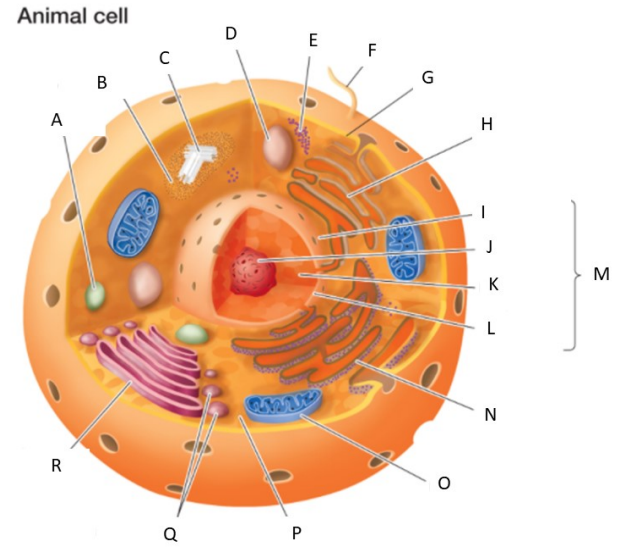
## Question 12 of 55




Identify the location of glycolysis

- **A)** R
- **B)** O
- **C)** M
- **D)** P

## Question 13 of 55




Identify the location of transcription

- **A)** C
- **B)** M
- **C)** N
- **D)** O

## Question 14 of 55

During the first few days of human development, cell proliferation is very rapid, and as cells divide by mitosis, the G1 and G2 phases are very short. How does this impact cell size during this period of development?

- **A)** Cells will be small
- **B)** This has no affect on the cell size
- **C)** Cells will become elongated
- **D)** Cells will be large

## Question 15 of 55

Put the major steps of mitosis in order.

| | | | |
|---|---|---|---|
| 1. [ ] | First Step of Mitosis | A. | Metaphase |
| 2. [ ] | Second Step of Mitosis | B. | Prophase |
| 3. [ ] | Thrid Step of Mitosis | C. | Anaphase |
| 4. [ ] | Fourth Step of Mitosis | D. | Telophase |

## Question 16 of 55

Because each sex cell is _____ and genetically unique, it can combine with another sex cell during fertilization to create offspring with genetic variation.

- **A)** Receptive
- **B)** Haploid
- **C)** Adaptive
- **D)** Inverted

## Question 17 of 55

Which of the following is a major difference between mitosis and meiosis?

- **A)** Meiosis produces four genetically unique cells, while mitosis produces two identical clones of the parent.
- **B)** Meiosis produces somatic cells, while mitosis produces sex cells.
- **C)** Meiosis involves one cell division, while mitosis involves two.
- **D)** Meiosis produces diploid cells, while mitosis produces haploid cells.

## Question 18 of 55

What provides the power for ATP Synthase to produce ATP?

- **A)** NADH
- **B)** FADH2
- **C)** Diffusion of H+
- **D)** ADP

## Question 19 of 55

What is the role of oxygen during respiration?

- **A)** It pumps hydrogen ions across the membrane, creating a membrane gradient
- **B)** It accepts electrons from the electron transport chain so that the ETC can continue working
- **C)** It breaks down CO2 to form water to keep you hydrated
- **D)** It becomes ATP, which is energy for the cell

## Question 20 of 55

Which compounds carry electrons to the electron transport chain?

- **A)** ATP and Cytochrome c
- **B)** ADP and Pyruvate
- **C)** NADH and FADH2
- **D)** NAD+ and ADP

## Question 21 of 55

Which of the following is true of the Electron Transport Chain?

- **A)** The movement of H+ ions through ATP synthase drives the transfer of electrons down the ETC.
- **B)** The movement of H+ ions across the inner membrane of the mitochondria drives the transfer of electrons down the ETC.
- **C)** The movement of electrons down the ETC drives the movement of ADP and phosphate through ATP synthase.
- **D)** The movement of electrons down the ETC drives the formation of a proton gradient.

## Question 22 of 55

The energy in ATP is stored in _____

- **A)** the two nitrogenous rings of adenine
- **B)** the amide functional group
- **C)** the bond between the second and third phosphate groups
- **D)** the 5-carbon bonds of ribose

## Question 23 of 55

What term is the sum total of all the chemical reactions that occur within the organism.

- **A)** anabolism
- **B)** cannibalism
- **C)** catabolism
- **D)** metabolism

## Question 24 of 55

What term is the breaking down of molecules to release energy.

- **A)** cannibalism
- **B)** metabolism
- **C)** catabolism
- **D)** anabolism

## Question 25 of 55

When do organisms use anaerobic pathways to generate energy?

- **A)** When glucose is available as a reactant
- **B)** When the cytoplasm is unavailable for cellular respiration
- **C)** When there is not enough oxygen available to undergo aerobic cellular respiration
- **D)** When the Krebs cycle is moving too slowly

## Question 26 of 55

How do lactic acid fermentation and alcohol fermentation differ?

- **A)** Carbon dioxide is released only during lactic acid fermentation.
- **B)** Lactic acid fermentation produces a 2-carbon compound, and alcohol fermentation produces a 3-carbon compound.
- **C)** Lactic acid fermentation can occur in large muscles in the human body, while alcohol fermentation occurs in yeast and some bacteria.
- **D)** Lactic acid fermentation produces lactose as a byproduct, and alcohol fermentation produces glucose.

## Question 27 of 55

What is the equation for cellular respiration?

- **A)** $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 36$ ATP
- **B)** $6C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 36$ ATP
- **C)** $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 18$ ATP
- **D)** $C_{12}H_{12}O_{12} + 6O_2 \rightarrow 6CO_2 + 6H_2O + 36$ ATP

## Question 28 of 55

Which 3-carbon molecule is one of the final products of glycolysis?

- **A)** Glucose
- **B)** 2-Phosphoglycerate
- **C)** ADP
- **D)** Pyruvate

## Question 29 of 55

Which are the products of fermentation?

- **A)** Galactose and Glucose
- **B)** 2 Lactic acid (lactate) and 2 NAD+
- **C)** Glucose and 2 NADH
- **D)** 2 Pyruvate and 2 NADH

## Question 30 of 55

Which of the following is not a product of respiration?

- **A)** ATP
- **B)** $CO_2$
- **C)** $H_2O$
- **D)** Glucose

## Question 31 of 55

What is the purpose of the FADH2 made during the citric acid cycle?

- **A)** It phosphorylates glucose
- **B)** It transports pyruvate around the cell
- **C)** It breaks down ATP
- **D)** It carries hydrogen and electrons to the electron transport chain

## Question 32 of 55

Which product of pyruvate oxidation enters the Krebs cycle?

- **A)** NADH
- **B)** Acetyl-CoA
- **C)** Carbon dioxide
- **D)** Glucose

## Question 33 of 55

In what part of the cell does the Krebs cycle take place?

- **A)** Cytosol
- **B)** Ribosome
- **C)** Nucleus
- **D)** Mitochondria

## Question 34 of 55

Which of the following statements about the Citric Acid cycle is most accurate?

- **A)** The Citric Acid cycle occurs as part of both aerobic and anaerobic respiration.
- **B)** Oxygen and water are produced in the Citric Acid cycle.
- **C)** The Citric Acid cycle is the first step in cellular respiration.
- **D)** The Citric Acid cycle produces both NADH and FADH2

## Question 35 of 55

Which statement about the properties of life is false?

- **A)** Organisms have an unchanging, constant internal environment.
- **B)** Organisms have the ability to reproduce.
- **C)** Organisms have the ability to take in energy and use it.
- **D)** Organisms have the ability to respond to stimuli from the environment.

## Question 36 of 55

Life is organized in a hierarchical fashion. Which sequence correctly lists that hierarchy from least inclusive to most inclusive?

- **A)** cell, molecule, organ system, organ, organelle, population, tissue, organism, ecosystem, community
- **B)** ecosystem, population, organ system, cell, community, molecule, organ, organism, organelle, tissue
- **C)** molecule, cell, organism, organ system, tissue, population, organ, organelle, community, ecosystem
- **D)** molecule, organelle, cell, tissue, organ, organ system, organism, population, community, ecosystem

## Question 37 of 55

The smallest unit capable of carrying out life functions is

- **A)** atom
- **B)** blood
- **C)** tissue
- **D)** a cell

## Question 38 of 55

When glucose levels in the blood rise, your brain sends a signal to your pancreas. The pancreas releases insulin, which opens channels in cell membranes to allow glucose to enter the cell, lowering blood sugar levels. This is an example of what?

- **A)** Homeostasis
- **B)** Evolution
- **C)** Growth and development
- **D)** Stimulus

## Question 39 of 55

The four most common elements in living organisms are

- **A)** C, H, O, N.
- **B)** C, N, O, Na.
- **C)** C, H, O, Fe.
- **D)** C, H, O, Na.

## Question 40 of 55

Which of the following trace elements needed by humans is commonly added to table salt?

- **A)** fluoride
- **B)** magnesium
- **C)** iron
- **D)** iodine

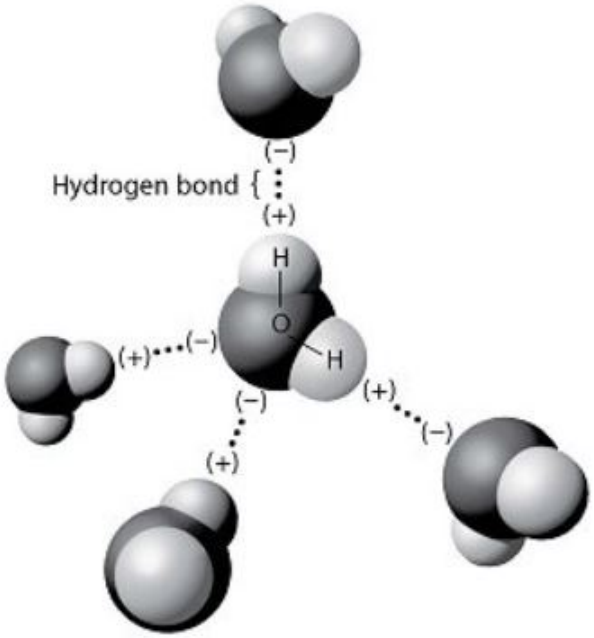
## Question 41 of 55

A(n) _____ forms when two atoms share electrons.

- **A)** ion
- **B)** hydrogen bond
- **C)** covalent bond
- **D)** ionic bond

## Question 42 of 55

The figure below shows five water molecules. The hydrogen bonds shown in this figure are each




- **A)** between two hydrogen atoms.
- **B)** between an oxygen and a hydrogen atom of different water molecules.
- **C)** between an oxygen and a hydrogen atom of the same water molecule.
- **D)** between two atoms with the same charge.

## Question 43 of 55

Glycolysis is the first step of cellular respiration, in which glucose is used to generate ATP to power the cell. The major chemical reaction that takes place in glycolysis (ignoring some other reactants and products) is the conversion of glucose ($C_6H_{12}O_6$) to pyruvate ($C_3H_4O_3$) and hydrogen ions ($H^+$). Using this information, what is the correct equation for the glycolysis chemical reaction?

- **A)** $C_6H_{12}O_6 \rightarrow 2\ C_3H_4O_3 + H^+$
- **B)** $C_6H_{12}O_6 \rightarrow C_3H_4O_3 + H^+$
- **C)** $2\ C_6H_{12}O_6 \rightarrow C_3H_4O_3 + 2\ H^+$
- **D)** $C_6H_{12}O_6 \rightarrow 2\ C_3H_4O_3 + 4\ H^+$

## Question 44 of 55

A buffer

- **A)** donates $OH^-$ ions when conditions become too basic and accepts $OH^-$ ions when conditions become too acidic.
- **B)** donates $H^+$ ions when conditions become too basic and accepts $H^+$ ions when conditions become too acidic.
- **C)** is an acid that is used to offset overly basic conditions in the body.
- **D)** is a base that is used to offset overly acidic conditions in the body.

## Question 45 of 55

In ocean acidification, dissolving $CO_2$ gas _____ the pH of the ocean.

- **A)** doubles
- **B)** lowers
- **C)** does not affect
- **D)** raises

## Question 46 of 55

Water molecules have the ability to dissolve many solutes associated with cells. Of the following choices, which property allows water to dissolve solutes?

- **A)** High Heat Capacity
- **B)** Cohesive Properties
- **C)** Polarity
- **D)** Non-Polarity

## Question 47 of 55

A solution with a pH of 7 is

- **A)** weakly acidic
- **B)** neutral
- **C)** weakly basic
- **D)** strongly acidic

## Question 48 of 55

What feature of fats makes them hydrophobic?

- **A)** Fats have nonpolar hydrocarbon chains
- **B)** Fats have carboxyl groups.
- **C)** Fats include one glycerol molecule
- **D)** Fats have polar fatty acids.

## Question 49 of 55

Proteins differ from one another because

- **A)** the sequence of amino acids in the polypeptide chain differs from protein to protein.
- **B)** the peptide bonds linking amino acids differ from protein to protein.
- **C)** the number of nucleotides found in each protein varies from molecule to molecule.
- **D)** each protein contains its own unique sequence of sugar molecules.

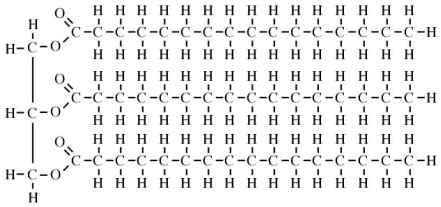
## Question 50 of 55

What is the correct flow of information in gene expression?

- **A)** Protein>RNA>DNA
- **B)** DNA>protein>RNA
- **C)** RNA>DNA>protein
- **D)** DNA>RNA>protein

## Question 51 of 55

Match the options below:

1. [ ] 

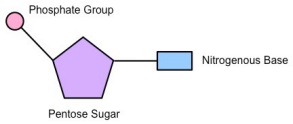
A. Carbohydrate

2. [ ] Secondary energy source in living things

B. Nucleic Acid

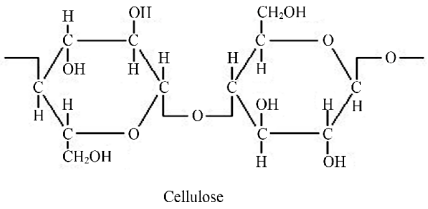
3. [ ] Primary energy source for living things

C. Lipid

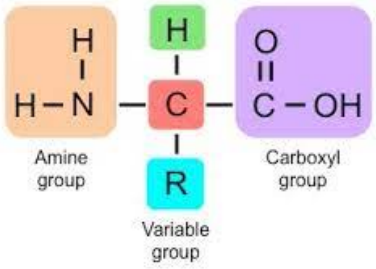
4. [ ] 


D. Protein

5. [ ] Makes muscle and other structures

6. [ ] 

Cellulose

7. [ ] 


8. [ ] Contains genetic information

## Question 52 of 55

The function of the nucleolus is

- **A)** to manufacture ribosomal RNA.
- **B)** to store chromatin.
- **C)** to manufacture polypeptides.
- **D)** intracellular digestion.

## Question 53 of 55

You are using a light microscope to view a cheek cell. You are able to see the nucleus and small bacteria around it when using the 40X objective lens. If the ocular magnification is 10X, what is your total magnification?

- **A)** 4X
- **B)** 10X
- **C)** 400X
- **D)** 40X

## Question 54 of 55

Kinetic energy differs from chemical energy in that

- **A)** chemical energy is a particular form of kinetic energy.
- **B)** kinetic energy is the energy of a moving object, whereas chemical energy is the potential energy of molecules.
- **C)** kinetic energy can be converted into various forms of energy, whereas chemical energy can only be converted into heat.
- **D)** kinetic energy is stored energy that has the potential to do work, and chemical energy is the energy of movement.

## Question 55 of 55

The active site of an enzyme is

- **A)** the highly changeable portion of an enzyme that adapts to fit the substrates of various reactions
- **B)** the region of a product that detaches from the enzyme
- **C)** the region of an enzyme that attaches to a substrate
- **D)** the region of a substrate that is changed by an enzyme