Mid-Semester Exam (25 Feb 2022)

Due No due date **Points** 50 **Questions** 50 **Time Limit** 30 Minutes

Instructions

This quiz has many multiple-choice questions. I am giving an average of 36 seconds for you to answer to each question. The overall time limit is 30 minutes and there are Fifty Questions. All the questions are from the study material provided to you.

Best Regards

Sriram

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	30 minutes	22 out of 50

Score for this quiz: **22** out of 50
Submitted Feb 25 at 3:30pm
This attempt took 30 minutes.

Question 1

0 / 1 pts

Identify the analogous Pair that is similar to: Glucose: Starch

You Answered

- (●) a nucleotide is to a nucleic acid

- ( ) a steroid is to a lipid.
- ( ) a nucleic acid is to a polypeptide.

Correct Answer

- ( ) a protein is to an amino acid.

Question 2

1 / 1 pts

is fatty acid an acid? why?

- ( ) It is capable of bonding with other molecules to form a fat.
- ( ) It does not dissolve in water

Correct!

- (●) It has a carboxyl group that can donate an H+ to a solution.

- ( ) It contains only two oxygen atoms.

Question 3

0 / 1 pts

Herbivores derive nutrients from cellulose while humans cannot. Why?

- Cellulose is converted to starch and can digest starch.
- They re-chew their food to break down cellulose fibers.
- You Answered — The digestive tract of cows contains microorganisms that can hydrolyze the bonds of cellulose.
- Correct Answer — Cows produce enzymes that recognize the shape of the glucose-glucose bonds and hydrolyze them.

Question 4

0 / 1 pts

One of the following functional group tends to make the organic compounds more hydrophilic. Which one?

- Correct Answer — hydroxyl
- amino
- carbonyl
- You Answered — All the given groups

Question 5

1 / 1 pts

There are two types of fats: Saturated and unsaturated- How do they differ

- Correct! — Unsaturated fats have double bonds in their fatty acid chains
- are associated with greater health risks than are saturated fats.
- are more common in animals than in plants.
- Unsaturated fats have fewer fatty acid molecules per fat molecule.

Question 6

1 / 1 pts

if H-bonding is disrupted, which structure of the protein has the least effect.

- secondary structure
- quaternary structure

Correct!

primary structure

tertiary structure

Question 7

0 / 1 pts

Two sugar molecules or two amino acids molecules can be covalently linked to form disaccharides or a peptide. This synthetic process is

Correct Answer

condensation

You Answered

glycosidic linkage

isomerization

ester linkage

hydrolysis

Question 8

1 / 1 pts

Structural polysaccharides typically

are much more hydrophilic than storage polysaccharides

Correct!

have extensive hydrogen bonding between adjacent molecules

form helical structures in the cell

have much stronger covalent bonds than do storage polysaccharides

consist of alternating a-glucose and b-glucose subunits

Question 9

0 / 1 pts

Which of the following associations between R (side-chain) groups are the strongest with proteins?

peptide bonds

You Answered

disulfide bridges

Correct Answer

hydrophobic interactions

hydrogen bonds

ionic bonds

Question 10

0 / 1 pts

If we intend to know detailed information about the shape and external features of a specimen. Which technique is best used.

fluorescence microscope

Correct Answer — transmission electron microscope

light microscope

You Answered — scanning electron microscope

Question 11

0 / 1 pts

Where can we see DNA in the eukaryotic cells.

Ribosomes

You Answered — chromatin

Correct! — mitochondria

Correct Answer — chromosomes

Question 12

1 / 1 pts

Eukaryotic and prokaryotic cells have some differences. Which of the following structures would not be found in prokaryotic cells?

ribosomes

Correct! — cell wall

nuclear area

propeller-like flagellum

Correct! — nucleus

Question 13

0 / 1 pts

The major role of the cell wall in bacteria is protecting the cell against changes in osmotic pressure, pressure caused by different solute concentrations in the environment. Bacterial cells swell but do not burst, in low solute concentrations. What happens to bacterial cells if a compound that interferes with the synthesis of the cell wall is added to an environment with low solute concentrations?

- Bacterial cells will shrink in size.
- Bacterial cells will shrink due to the lack of cell wall material.
- Bacterial cells may burst due to the influx of water. — Correct Answer
- Bacterial cells remain normal; they have alternative pathways to synthesize cell walls. — You Answered

Question 14

0 / 1 pts

Which of the following could most effectively be visualized with a scanning electron microscope?

- a three-dimensional view of the surface of a membrane — Correct!
- cells swimming in a drop of pond water.
- details of structures inside cells — You Answered
- the movement of molecules inside the cell — You Answered

Question 15

1 / 1 pts

Which organelle is closely associated with protein synthesis?

- ribosomes — Correct!
- smooth ER
- lysosomes
- microfilaments
- mitochondria

Question 16

1 / 1 pts

- The alpha-helix and the beta-pleated sheet are part of which protein structure?

The quaternary structure

The primary structure

The tertiary structure

Correct! The secondary structure

Question 17

0 / 1 pts

One of the following statements correctly describes the differences between cellulose and starch.

You Answered: Starch is unbranched and cellulose is branched. Both molecules are found in plants.

Cellulose is unbranched and starch is branched. Both molecules are found in animals.

Correct Answer: Starch is branched and cellulose is unbranched. Both molecules are found in plants.

Cellulose is branched and starch is unbranched. Both molecules are found in animals

Question 18

1 / 1 pts

How do phospholipids contribute to cell membrane structure?

Correct! Phospholipids orient their heads toward the polar molecules and tails in the interior of the membrane, forming a bilayer.

Phospholipids orient their tails toward the polar molecules of water solutions and their heads toward in the interior of the membrane, forming a bilayer.

Phospholipids orient their heads toward the nonpolar molecules and their tails toward the interior of the membrane, forming a bilayer.

Phospholipids orient their tails toward the polar molecules and their heads toward the nonpolar side of the membrane, forming a bilayer

Question 19

1 / 1 pts

What part of the cell membrane gives flexibility to the structure?

- Carbohydrates
- Proteins
- Cytoskeleton filaments
- Lipids

Correct!

Question 20

1 / 1 pts

What causes the changes in protein structure through its three or four levels of structure?

Correct!

- The primary chain forms secondary helix and pleated sheets that fold onto each other forming the tertiary structure.
- The primary structure forms secondary helix and pleated sheets. These further undergo phosphorylation and acetylation to form the tertiary structure.
- The primary structure undergoes alternative splicing to form a secondary structure, and then disulfide bonds give way to tertiary structures
- The primary structure undergoes alternative splicing to form secondary structures that fold on other protein chains to form tertiary structures.

Question 21

0 / 1 pts

What structural level of proteins is functional? Why?

You Answered

- The secondary structure is functional as it attains its two-dimensional shape, which has the necessary bonds.

Correct Answer

- The tertiary structure is functional, as it possesses the geometric shape showing the necessary loops and bends.
- The quaternary structure is functional, as it has the essential set of subunits.
- The tertiary structure is functional as it has the non-covalent and covalent bonds along with the subunits attached at the right places, which help it function properly.

Question 22

0 / 1 pts

The fatty acids of triglycerides are classified as saturated, unsaturated, or trans fat. What about the structure of these compounds gives them their physical characteristics?

You Answered

- Unsaturated and trans fats are the same; fatty acids are only found on opposite sides of a trans fat.

- Saturated fats and trans fats contain the greatest possible number of hydrogen atoms, while unsaturated fats do not.

Correct Answer

- Unsaturated fats and trans fats have some double-bonded carbon atoms, while saturated fats do not.

- Saturated and unsaturated fats have stable configurations, while trans fats are transient.

Question 23

0 / 1 pts

Carbohydrates serve various functions in different animals. Arthropods, like insects, crustaceans, and others, have an outer layer, called the exoskeleton, which protects their internal body parts. This exoskeleton is made mostly of chitin. Chitin is also a major component of the cell walls of fungi, the kingdom that includes molds and mushrooms. Chitin is a polysaccharide. What is the major difference between chitin and other types of polysaccharides?

You Answered

- Chitin contains phosphate groups that give it a stiffness not found in other polysaccharides

- Chitin is similar to starch, a polysaccharide

Correct Answer

- Chitin is a nitrogen-containing polysaccharide, with repeating units of N-acetyl- -D-glucosamine, a modified sugar.

- Chitin is similar to amylase, but with sulfur linkages between the monomers.

Question 24

0 / 1 pts

Mitochondria are observed in plant cells that contain chloroplasts. Why do you find mitochondria in photosynthetic tissue?

You Answered

- Mitochondria participate in the Calvin cycle/light-independent reactions of photosynthesis.

- Mitochondria and chloroplasts work together to use light energy to make sugars.

Mitochondria are not needed but are an evolutionary relic.

Correct Answer

Mitochondria are required to break down sugars and other materials for energy.

Question 25

1 / 1 pts

Which statement is a possible explanation for the presence of a rigid cell wall in plants?

Correct!

Plant cells have a rigid cell wall to protect themselves from grazing animals.

Plant cells have a rigid cell wall to prevent the influx of waste material.

Plants are subjected to variations in osmotic pressure, and a cell wall helps them against bursting or shrinking.

Plants remain exposed to changes in temperature and thus require rigid cell walls to protect themselves.

Question 26

1 / 1 pts

How does the structure of a plasmodesma differ from that of a gap junction?

Correct!

Gap junctions are essential for transportation in animal cells, and plasmodesmata are essential for the movement of substances in plant cells.

Plasmodesmata are essential for communication between animal cells, and gap junctions are necessary for attachment of cells in plant cells.

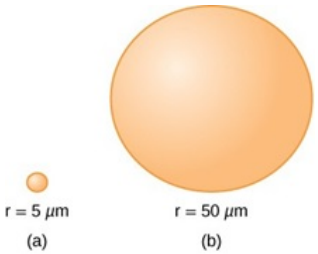
Plasmodesmata help in transportation, and gap junctions help in attachment in plant cells.

Gap junctions are found to provide attachment in animal cells, and plasmodesmata are essential for the attachment of plant cells.

Question 27

1 / 1 pts

Looking at this image, what could you decipher about cell (b) likely have when compared to cell (a)?



Correct!

- (●) Smaller surface area-to-volume ratio
- ( ) Larger surface area and smaller volume
- ( ) Smaller surface area and larger volume
- ( ) Larger surface area-to-volume ratio

Question 28

1 / 1 pts

Macrophages ingest and digest many pathogens. Which organelle plays a major role in the activity of macrophages?

- ( ) nucleus

Correct!

- (●) Chloroplast
- ( ) Lysosome
- ( ) Peroxisome

Question 29

0 / 1 pts

Water moves via osmosis in which direction?

You Answered

- (●) From an area with a low concentration of water to one of higher concentration
- ( ) Throughout the cytoplasm

Correct Answer

- ( ) From an area with a high concentration of water to one of lower concentration
- ( ) From an area with a high solute concentration to a lower one

Question 30

0 / 1 pts

Which of the following questions can be asked about organisms that live in fresh water?

- ( ) Will their bodies lose too much water to their environment

Correct Answer

- ( ) Will their bodies take in too much water?
- ( ) Can they control their tonicity?

You Answered

- (●) Can they survive in saltwater?

Question 31

0 / 1 pts

In what important way does receptor-mediated endocytosis differ from phagocytosis?

You Answered

- It transports only small amounts of fluid.

- It does not involve the pinching off of the membrane.

Correct Answer

- It brings in only a specifically targeted substance.

Question 32

0 / 1 pts

A doctor injects a patient with what the doctor thinks is an isotonic saline solution. The patient dies, and an autopsy reveals that many red blood cells had burst. Was the solution the doctor injected really isotonic?

You Answered

- No, the solution was hypertonic.

- No, the solution was either hypotonic or hypertonic.

- Yes, the solution was isotonic.

Correct Answer

- No, the solution was hypotonic.

Question 33

1 / 1 pts

What is most likely to happen if paramecia are moved from a hypertonic solution to solutions of decreasing osmolarity?

Correct!

- The rate of contraction would increase with decreasing osmolarity because more water diffuses into the paramecium.

- The rate of contraction would decrease with decreasing osmolarity because more salt diffuses into the paramecium.

- The rate of contraction would increase with decreasing osmolarity because more salt diffuses into the paramecium.

The rate of contraction would decrease with decreasing osmolarity because more water diffuses into the paramecium.

Question 34

0 / 1 pts

What is bacterial transformation?

You Answered

- It is the transformation of a bacterium into a pathogenic form.

- The transformation of a bacterium occurs during replication.

Correct Answer

- Transformation is a process in which external DNA is taken up by a cell, thereby changing morphology and physiology

- Transformation of bacteria involves changes in its chromosome.

Question 35

1 / 1 pts

If DNA of a particular species was analyzed and it was found that it contains 30 percent A, what would be the percentage of T?

Correct!

- 30%

- 27%

- 54%

- 70%

Question 36

1 / 1 pts

Which enzyme initiates the splitting of the double DNA strand during replication?

- Telomerase

Correct!

- Helicase

- Ligase

- DNA gyrase

Question 37

0 / 1 pts

The DNA of virus A is inserted into the protein coat of virus B. The combination virus is used to infect E. *coli*. The virus particles produced by the infection are analyzed for DNA and protein. What results would you expect?

You Answered

- (●) DNA from B and protein from A

- ( ) DNA and protein from B
- ( ) DNA from A and protein from B

Correct Answer

- ( ) DNA and protein from A

Question 38

1 / 1 pts

The AUC and AUA codons in mRNA both specify isoleucine. What feature of the genetic code explains this?

- ( ) Universality

Correct!

- (●) Degeneracy

- ( ) Complementarity
- ( ) Nonsense codons

Question 39

1 / 1 pts

Where are the RNA components of ribosomes synthesized?

Correct!

- (●) Nucleolus

- ( ) Cytoplasm
- ( ) Nucleus
- ( ) Endoplasmic reticulum

Question 40

0 / 1 pts

What part of the central dogma is NOT always followed in viruses?

The flow of information is from protein to RNA in HIV, while the influenza virus converts DNA into RNA.

The flow of information is similar, but nucleic acids are synthesized as a result of translation in HIV and influenza viruses.

You Answered

The flow of information is from RNA to protein. This protein is used to synthesize the DNA of the viruses in HIV and influenza.

Correct Answer

The flow of information in HIV is from RNA to DNA, then back to RNA to protein. Influenza viruses never go through DNA.

Question 41

0 / 1 pts

How are GMOs created?

Correct Answer

Introducing recombinant DNA into an organism by any means

Mutagenesis

In vitro fertilization methods

You Answered

Plant breeding techniques

Question 42

0 / 1 pts

What is Bt toxin is considered to be?

Correct Answer

An organic insecticide produced by bacteria

A strain of genetically modified tomatoes

You Answered

A gene for modifying insect DNA

A nerve toxin in humans

Question 43

0 / 1 pts

Which best describes the structure of a cell membrane?

You Answered

proteins between two bilayers of phospholipids

a bilayer of protein coating a layer of phospholipids

proteins embedded in a bilayer of phospholipids

Correct Answer

cholesterol embedded in a bilayer of phospholipids

Question 44

0 / 1 pts

Large numbers of ribosomes are present in cells that specialize in producing which of the following molecules?

starches

steroids

You Answered

proteins

glucose

Correct Answer

lipids

Question 45

1 / 1 pts

Tay-Sachs disease is a human genetic abnormality that results in cells accumulating and becoming clogged with very large and complex lipids. Which cellular organelle must be involved in this condition?

Correct!

the lysosome

membrane-bound ribosomes

the Golgi apparatus

the endoplasmic reticulum

mitochondria

Question 46

0 / 1 pts

The mitochondrion, like the nucleus, has two or more membrane layers. How is the innermost of these layers different from that of the nucleus?

The inner membrane of the mitochondrion is separated out into thylakoids.

The two membranes are biochemically very different.

You Answered

- The inner mitochondrial membrane is devoid of nearly all proteins.
- The space between the two layers of the nuclear membrane is larger.

Correct Answer

- The inner mitochondrial membrane is highly folded.

Question 47

0 / 1 pts

Which of the following correctly describes the order of movement of K+ ion from soil into the vacuole of a cell on the surface of a root.

- tonoplast → primary cell wall → plasma membrane → cytoplasm

You Answered

- plasma membrane → primary cell wall → cytoplasm → tonoplast

Correct Answer

- primary cell wall → plasma membrane → cytoplasm → tonoplast
- primary cell wall → plasma membrane → tonoplast → cytoplasm → vacuole
- secondary cell wall → plasma membrane → primary cell wall → cytoplasm → tonoplast

Question 48

1 / 1 pts

If the sequence of the 5′ to 3′ strand is AATGCTAC, then the complementary sequence has which sequence?

- 5'-TTACGATG-3'
- 3′-AATGCTAC-5′
- 3′-CATCGTAA-5′
- 3′-GTAGCATT-5'

Correct!

- 3′-TTACGATG-5′

Question 49

1 / 1 pts

A forensic scientist has recovered a tiny bit of organic material from a crime-scene. They would like to compare DNA from the sample with DNA from living birds. Which of the following would be most useful for increasing the amount of DNA available for testing?

- electrophoresis
- restriction fragment analysis

Correct!

- polymerase chain reaction
- molecular probe analysis

Question 50

0 / 1 pts

In terms of DNA and RNA structure, what is a nucleotide?

You Answered

- A nucleotide is a heterocyclic base

- A nucleotide is a sugar molecule covalently bonded to a heterocyclic base
- A nucleotide is a heterocyclic base bonded to phosphate group/s

Correct Answer

- A nucleotide is a sugar molecule bonded to phosphate group/s and a heterocyclic base

Quiz Score: **22** out of 50