1	**Which of the following concerning nucleic acids is FALSE?**	
	A. The C-1' carbon of pentose binds to the N-9 nitrogen of adenine	B. The 5' end has free phosphate group
	C. RNA contains the purine base uracil, while DNA does not	D. In any segment of double stranded DNA, amount of cytosine equals amount of guanine
	E. All of them are true	
2	**Chlorophyll is a**	
	A. terpene	
	C. steroid	B. fat
	E. wax	D. phospholipid
3	**When bacteria are studied with a bright field microscope, these organisms needed to be stained in order to be visualized.**	
	A. True	B. False
4	**The cis-fatty acids are more healthy than trans-fatty acids because they are more stable.**	

			D. phosphonlpid
	C. steroid		
	E. wax		
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	A. True	B. False	
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	A. True	B. False	
5	A tripeptide has----------		
	A. 3 amino acids and 1 peptide bond	B. 3 amino acids and 2 peptide bonds	
	C. 4 amino acids and 3 peptide bonds	D. 5 amino acids and 3 peptide bonds	
	E. 3 amino acids and 3 peptide bonds		
6	Which of the following amino acids combinations have side chains with groups that have the greatest ability to stabilize the tertiary structure of a protein?		
	A. Proline and aspartic acid	B. Lysine and arginine	
	C. Valine and threonine	D. Glutamate and lysine	
	E. None of them		
7	The diameter of a typical bacterial cell is approximately		
	A. 30 µ m	B. 1-2 mm	

7	**The diameter of a typical bacterial cell is approximately**	
	A. 30 μ m	B. 1-2 mm
	C. 2-3 μ m	D. 20 nm
	E. 1-2 nm	
8	**The plants can tolerate extreme cold by**	
	A. increasing the percentage of saturated phospholipids	B. increasing the percentage of cholesterol molecules
	C. increasing the percentage of unsaturated phospholipids	D. increasing the percentage of glycolipid molecules
	E. increasing the percentage of glycoprotein molecules	
9	**Which of the following is NOT characteristic of viruses?**	
	A. Viruses can reproduce by dividing in two	B. Viruses have nucleic acids
	C. Viruses cannot reproduce outside the host cell	D. Viruses lack plasma membrane
	E. Viruses cannot be seen by light microscope	
10	**For embedded part of transmembrane proteins, the R-groups of threonine, serine and lysine are found on the outside surface of protein.**	
	A. True	B. False

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	A. True	B. False
11	**Hydrophobic interactions help to stabilize the ——— structures of a protein.**	
	A. secondary and tertiary	B. tertiary and quaternary
	C. secondary and quaternary	D. secondary, tertiary and quaternary
12	**Which of the following concerning lipids is FALSE?**	
	A. Waxes are formed by ester bond between saturated fatty acid and saturated alcohol	B. Steroids do not contain fatty acids
	C. Triglycerides are formed from their building units by dehydration reactions	D. Phospholipid molecules of cell membrane are bonded by ester bonds
	E. Disassembling of lipids releases energy	

13	**Which is FALSE about bacteria?**	
	A. Capsule enables the bacterium to be pathogenic	B. Pili and capsules can connect bacteria with host cell
	C. Some bacteria have one or more flagella	D. Plasmids are linear segments of double stranded DNA
14	**The more stable ring formation in D-fructose involves the reaction between**	
	A. C_1 and C_4	B. C_2 and C_4
	C. C_1 and C_5	D. C_2 and C_5
	E. C_2 and C_6	
15	**The chromosome that looks like "I" during anaphase is called**	
	A. telocentric chromosome	B. acrocentric chromosome
	C. submetacentric chromosome	D. metacentric chromosome
16	**What do phase-contrast and dark-field microscopes have in common?**	
	A. They make specimens appear dark on a bright background	B. They make specimens appear bright on

	A. C_1 and C_4	B. C_2 and C_4
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	A. They make specimens appear dark on a bright background	B. They make specimens appear bright on a dark background
	C. They increase contrast between the specimens and their surroundings without staining	D. They make specimen visible because the scattered light from specimen goes away from the objective lens
17	**Chitin and cellulose are linear structural homopolysaccharides of residues linked with β(1→ 4) glycosidic bonds.**	
	A. True	B. False
18	**Penicillin can kill bacteria by hydrolyzing the β(1→ 4) glycosidic bonds between N-acetylglucosamine**	

	C. They increase contrast between the ... surroundings without staining	away from the object ...
17	Chitin and cellulose are linear structural homopolysaccharides of residues linked with β(1→ 4) glycosidic bonds.	
	A. True	B. False
18	Penicillin can kill bacteria by hydrolyzing the β(1→ 4) glycosidic bonds between N-acetylglucosamine and N-acetylmuramic acid.	
	A. True	B. False
19	Which one of the following statements about protein structure is correct?	
	A. Proteins consisting of one polypeptide chain can have quaternary structure.	B. The denaturation of proteins leads to irreversible loss of tertiary structure.
	C. The information required for the correct folding of a protein is contained in the specific sequence of amino acids along the polypeptide chain.	D. secondary structures are stabilized through hydrogen bonds between different amino acid side chains
20	The organisms carry out all metabolic activities at proper rate in a process called	

	quaternary structure.	
	C. The information required for the correct folding of a protein is contained in the specific sequence of amino acids along the polypeptide chain	D. secondary structures are stabilized through hydrogen bonds between different amino acid side chains
20	**The organisms carry out all metabolic activities at proper rate in a process called**	
	A. energy processing	B. homeostasis
	C. coordination	D. sensitivity
	E. regulation	
21	**Which of the following concerning saturated fatty acids is TRUE?**	
	A. They are more common in plants than in animals	B. They don't pack together tightly
	C. They are generally liquid at room temperature	D. They pack together tightly
22	**Which of the following statements concerning protein structure is FALSE?**	
	A. If asparagine, serine, threonine, and cysteine are close together in chain, they can destabilize an α-helix	B. Denaturation of protein can result in destruction of ionic bonds
	C. Hydrophilic amino acid residues are found in the interior of a water-soluble globular protein	D. In protein, cross links between the R groups of cysteine are known as disulfide

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23	**Cell size is an important factor in causing a cell to divide because a cell's**	
	A. surface area does not grow as fast as its volume	B. volume does not grow as fast as its surface area
	C. shape often changes	D. need for materials to be moved across its membrane is reduced

24	**Buffer**	
	A. accepts hydrogen ions from the solution when base is added	B. causes an increase in pH of the solution when base is added
	C. cause a decrease in pH of the solution when acid is added	D. gives hydrogen ions to the solution when base is added
25	**Botany deals with study of**	
	A. animals	B. algae
	C. plants	D. fungi
	E. insects	
26	**The function of a protein is determined by**	
	A. the shape of the protein.	B. the number of amino acids.
	C. the sequence of amino acids.	D. B & C
	E. All of them	
27	**Which is in the correct descending order?**	
	A. Kingdom- Phylum-Class- Family-Order-Genus-Species	B. Kingdom-Phylum-Class-Order-Family-Genus-Species
	C. Kingdom Phylum Order Class Family Genus Species	D Kingdom Phylum Family Order Class

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	C. Kingdom-Phylum-Order-Class-Family-Genus-Species	D.Kingdom-Phylum-Family-Order-Class-Genus-Species
28	Attraction between water molecules and cell wall of xylem cells of plants is called	
	A. covalent bond	B. cohesion
	C. ionic bond	D. adhesion
	E. hydrophobic interaction	
29	Which molecules in the cell membrane are mostly glycoproteins?	
	A. channel proteins	B. carrier molecules
	C. receptor molecules	D. marker molecules
	E. transport proteins	
30	Which of the following is NOT true of smooth ER?	
	A. makes enzymes	B. makes testosterone
	C. pumps calcium ions	D. detoxifies drugs

	E. hydrophobic interaction	
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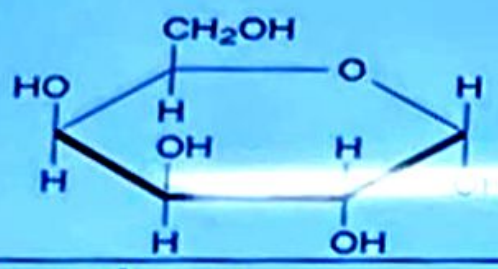
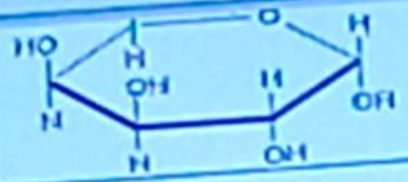
	A. makes enzymes	B. makes testosterone
	C. pumps calcium ions	D. detoxifies drugs
	E. makes triglycerides	
31	**Which of the following is NOT true about fungi?**	
	A. Eukaryote	B. 80S ribosomes
	C. Single chromosome	D. Golgi bodies
	E. Cell wall	
32	**Which of the following is FALSE about plasma membrane?**	
	A. Membrane proteins can attach the membrane to the cytoskeleton	B. Membrane lipids are able to spontaneously move between the outer and inner surfaces

	C. Different lipid compositions are found in the two sides of a membrane	and inner surfaces
33	**All the following are true about chromosomes EXCEPT**	D. Transmembrane proteins can only be found on one side of a membrane
	A. Eukaryotic cell contains several chromosomes	B. Nucleosome is composed of histone proteins around DNA
	C. Chromatin is the same structure of chromosome (DNA with proteins)	D. kinetochore is a protein disc that assists in cell division
	E. Cohesin proteins hold the DNA of the sister chromatids together	
34	**Which structure protects bacteria from excessive uptake of water?**	
	A. Capsule	B. Pili
	C. Flagella	D. Cell wall
	E. Cell membrane	

35	Which of the following is the largest single membrane-bound intracellular compartment?	
	A. Ribosome	B. Golgi apparatus
	C. Nucleus	D. Endoplasmic reticulum
	E. Lysosome	
36	All the following are true about autophagolysosome EXCEPT	
	A. It digests damaged mitochondria	B. It digests bacteria
	C. It has acidic conditions	D. It digests stored proteins
	E. It is secondary lysosome	
37	Where are the ribosome's proteins synthesized?	
	A. Nucleolus	B. Cytoplasm
	C. Endoplasmic reticulum	D. Golgi bodies
38	Which of the following amino acids is mostly likely to disrupt an alpha helix?	
	A. Leucine	B. Proline
	C. Valine	D. Serine
	E. Lysine	
39	Altering which of the following levels of proteins could disrupt their activities?	

39	Altering which of the following levels of proteins could disrupt their activities?	
	A. primary	B. secondary
	C. tertiary	D. secondary and tertiary
	E. primary, secondary and tertiary	
40	The following structure is 	
	A. α-glucose	B. α-galactose
	C. β-glucose	D. β-galactose
41	Which of the following statements about DNA structure is FALSE?	
	A. Guanine consists of two fused rings; cytosine has one ring.	B. A nucleotide consists of a deoxyribos



	A. α-glucose	B. α-galactose
	C. β-glucose	D. β-galactose
41	Which of the following statements about DNA structure is FALSE?	
	A. Guanine consists of two fused rings; cytosine has one ring.	B. A nucleotide consists of a deoxyribose, a phosphate, and a nitrogenous base.
	C. The "backbone" of DNA consists of alternating sugar and base component	D. A purine always pairs with a pyrimidine
42	Which of the following statements about water is NOT correct?	
	A. Conversion of water from a liquid to gas requires large amount of energy	B. Molecules of water in ice are less closely packed than molecules of liquid water.
	C. Oxygen atoms in a water molecule are partial negatively charged and hydrogen atoms are partial positively charged	D. Hydrogen bonds act inside each water molecule to attach both hydrogen atoms to a single oxygen atom.
43	What best describes glycogen?	
	A. unbranched linear polymer with alpha 1–4 glycosidic	B. unbranched linear polymer with beta 1-

	C. The "backbone" of DNA consists of alternating sugar and base component	D. A purine always pairs with a pyrimidine
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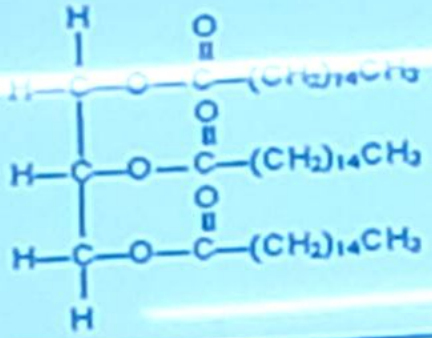
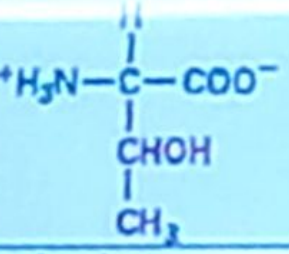
43	**What best describes glycogen?**	
	A. unbranched linear polymer with alpha 1-4 glycosidic linkages	B. unbranched linear polymer with beta 1-4 glycosidic linkages
	C. highly branched, branched sites contain alpha 1-6 glycosidic linkages	D. highly branched, branched sites contain beta 1-6 glycosidic linkages

44	What type of molecule is shown below? 	
	A. Wax	B. Phospholipid
	C. Fat	D. Saturated fatty acid
	E. Steroid	
45	The zygote and somatic cells of human should have 46 chromosomes.	
	A. True	B. False
46	All the following is true about ribosomes EXCEPT	
	A. A ribosome is ribonucleoprotein complex	B. The bacterial cell has 18S rRNA
	C. bacterial cells have 70S ribosomes (large 50S subunits and	D. Human cell contains ribosomes more

	A. True	B. False
46	All the following is true about ribosomes EXCEPT	
	A. A ribosome is ribonucleoprotein complex	B. The bacterial cell has 18S rRNA
	C. bacterial cells have 70S ribosomes (large 50S subunits and small 30S subunits)	D. Human cell contains ribosomes more than in bacteria
47	The following structure is 	
	A. leucine	B. valine
	C. alanine	D. threonine
	E. serine	
48	Which structure-function pair is mismatched?	
	A. Glyoxysome; converts lipids into carbohydrates	B. Smooth ER; blood glucose homeostasis
	C. Golgi bodies; synthesis and movement of lipids	D. Nucleolus; production of ribosomal subunits
	E. Peroxisome - oxidation	

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	C. Golgi bodies; synthesis and movement of lipids	D. Nucleolus; production of ribosomal subunits
	E. Peroxisome - oxidation	
49	All the following statements concerning carbohydrates are true EXCEPT	
	A. Table sugar consists of fructose and glucose	B. Deoxyribose and dihydroxyacetone are aldoses
	C. Cellulose is not a nutrient for humans, but it is a nutrient for cows	D. L-glucose and D-galactose are stereoisomers.
50	All the following are true concerning nucleic acids EXCEPT	
I	A. RNA usually is a single strand except in viruses, it may be double strands	B. When an enzyme hydrolyzes a DNA molecule, hydrogen bonds are being broken
	C. Complementary base pairing occurs within RNA molecule and between two different RNA molecules	D. The antiparallel nature of double-stranded DNA means that the two strands run from 5' to 3' in opposite direction.
	E. All of them are correct	