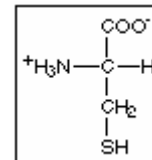




Multiple Choice Questions: Choose the most appropriate answer and shade the letter corresponding to the correct answer on the computerized answer sheet.

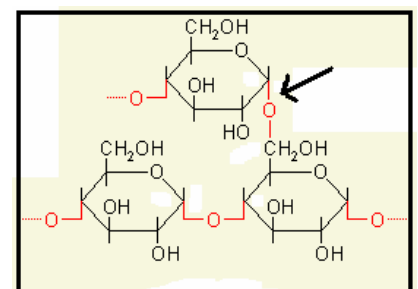
- Evaporation from leaves pulls water upward from the roots through water-conducting cells. Which bonds BETWEEN water molecules help hold together the column of water within plant vessels?
 A. Polar covalent bonds *B. Hydrogen bonds C. Adhesive forces
 D. Nonpolar covalent bonds E. Ionic bonds
- Ice is less dense than liquid water because
 *A. it has fewer molecules than an equal volume of liquid water.
 B. less bonds are formed between its molecules.
 C. its molecules have greater kinetic energy.
 D. its molecules absorb more heat.
 E. its molecules are attracted to each other by ionic bonds.
- The water's property that enables an insect to walk on the surface of water is
 *A. high surface tension B. low specific heat C. high specific heat
 D. adhesion E. ionic bonds between water molecules
- Which of the following is INCORRECTLY matched?
 A. Solvent / Dissolving agent B. Solute / Dissolved substance
 C. Aqueous solution / Water is solvent D. Water / Versatile solvent
 *E. Aqueous solution / Organic solvent
- Some substances are hydrophilic but insoluble in water such as
 A. oils *B. colloids C. NaCl D. glucose E. B, C, and D
- This molecule is a (an)
 A. ketone B. hydrocarbon C. aldehyde
 *D. amino acid E. organic phosphate



- Amino acids are called acids because they possess a(an) group.
 A. amino B. carbonyl *C. carboxyl D. sulfhydryl E. aldehyde
- A measure of how well a liquid can resist changes in temperature when absorbing or releasing large amounts of heat, is termed
 *A. specific heat B. surface tension C. evaporative cooling
 D. cohesion E. adhesion

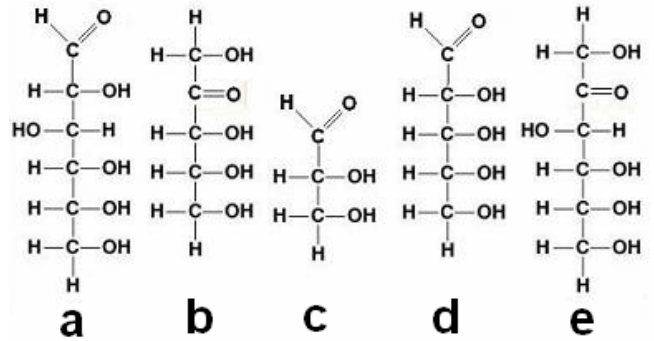
Refer to the figure to answer questions 9-10

- The structure in the figure could be a part of
 A. amylose *B. amylopectin C. cellulose
 D. chitin E. collagen
- Linkage pointed at by the arrow is glycosidic linkage.
 A. α -1,2 B. α -1,4 *C. α -1,6
 D. β -1,4 E. β -1,6



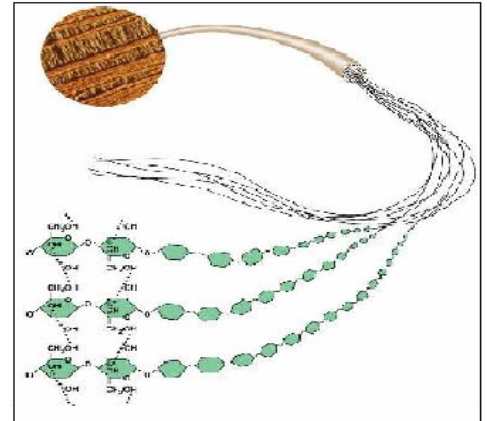
Refer to the figure to answer questions 11-12

11. Which of the following is an aldose pentose sugar?
 A. a B. b C. c *D. d E. e
12. Which sugars are ketoses?
 A. a, and e B. b and d C. c and d
 D. a, c and d *E. b and e



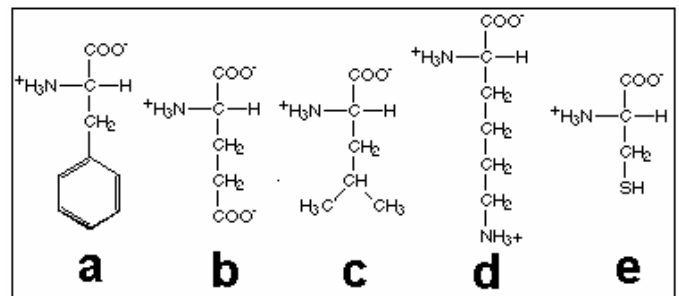
Refer to the figure to answer questions 13-14

13. Which of the following is **INCORRECT** about the structure in the figure? It is
 A. a major component of plant cell wall
 B. a hydrophilic molecule
 *C. a storage polysaccharide
 D. reinforced by hydrogen bonds
 E. a linear polymer of β -1,4 glycosidic linkage
14. This structure is similar to chitin in all of the following **EXCEPT**.....
 A. both are linear polymers
 B. both are composed of hexose monomers
 C. in both monomers are linked by β -1,4 glycosidic linkage
 D. both are structural polysaccharides
 *E. both have nitrogen containing appendages



Refer to the figure to answer questions 15-16.

15. Which two amino acids could be involved in **HYDROPHOBIC** interaction in tertiary protein structure?
 *A. a and c B. b and d C. a and b
 D. c and d E. b and e
16. Which amino acid has an acidic side chain?
 A. a *B. b C. c D. d E. e



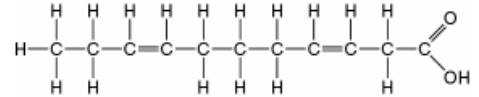
17. Substitution of glutamic acid with valine at the 6th position in β -subunit of hemoglobin results in all of the following **EXCEPT**:
 A. change in primary structure B. affects polypeptide folding
 C. Sickle-cell disease in human *D. cardiovascular disease and atherosclerosis
 E. hemoglobin crystallization into a fiber
18. All of the following are correct about a polypeptide molecule **EXCEPT**
 *A. it is a branched polymer B. has polarity with N-terminus and C-terminus
 C. formed by condensation (dehydration) reactions D. monomers are linked by peptide bonds
 E. each type has a unique sequence of amino acids.
19. Proteins are involved in all of the following **EXCEPT**:
 A. signal receptor B. transport *C. compact energy storage
 D. body defense E. enzymes

20. Which of the following contains phospholipids?

- *A. Plasma membrane B. Butter C. Corn oil D. Starch E. Cellulose

21. The molecule shown in the figure is a(an).....

- A. polysaccharide. B. polypeptide. C. glycerol
D. saturated fatty acid. *E. unsaturated fatty acid



22. DNA nucleotide differs from RNA nucleotide because DNA contains.....

- A. purine not pyrimidine nitrogenous base. B. phosphodiester bond not found in RNA.
*C. deoxyribose sugar rather than ribose sugar. D. phosphate groups not found in RNA.
E. adenine base not found in RNA nucleotides.

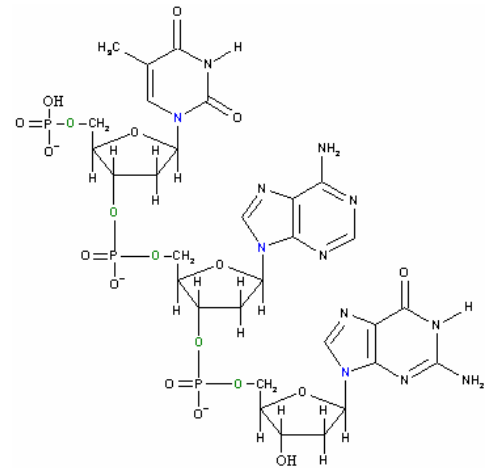
Refer to the figure to answer questions 23-24.

23. The number of phosphodiester bonds is

- A. 1 *B. 2 C. 3 D. 4 E. 5

24. The shown nucleic acid contains.....

- A. one purine, 2 pyrimidines and three ribose sugars
B. three purines and three ribose sugars
C. three pyrimidines and three deoxyribose sugars
D. two purines, one pyrimidine and three ribose sugars
*E. two purines, one pyrimidine and three deoxyribose sugars.



25. Cell fractionation enables scientists to

- A. identify the three-dimensional structure of protein.
B. identify the enzymes outside the organelles.
C. determine the size of the cell
*D. separate the major organelles and determine their function.
E. all of the above

26. The upper limit of a cell size is determined by the.....

- A. cell wall B. amount of organelles inside the cell
C. plasma membrane *D. ratio of surface to volume E. both A and C

27. A prokaryotic cell does **NOT** contain

- A. nucleic acid molecules *B. a membrane bounded nucleus
C. ribosomes D. flagella E. a plasma membrane

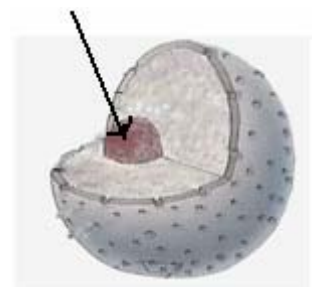
Refer to the figure to answer questions 28-29.

28. In the figure shown, the arrow points to the

- A. nucleus *B. nucleolus C. central vacuole
D. peroxisome E. lysosome

29. The structure in the figure shown is bounded by.....

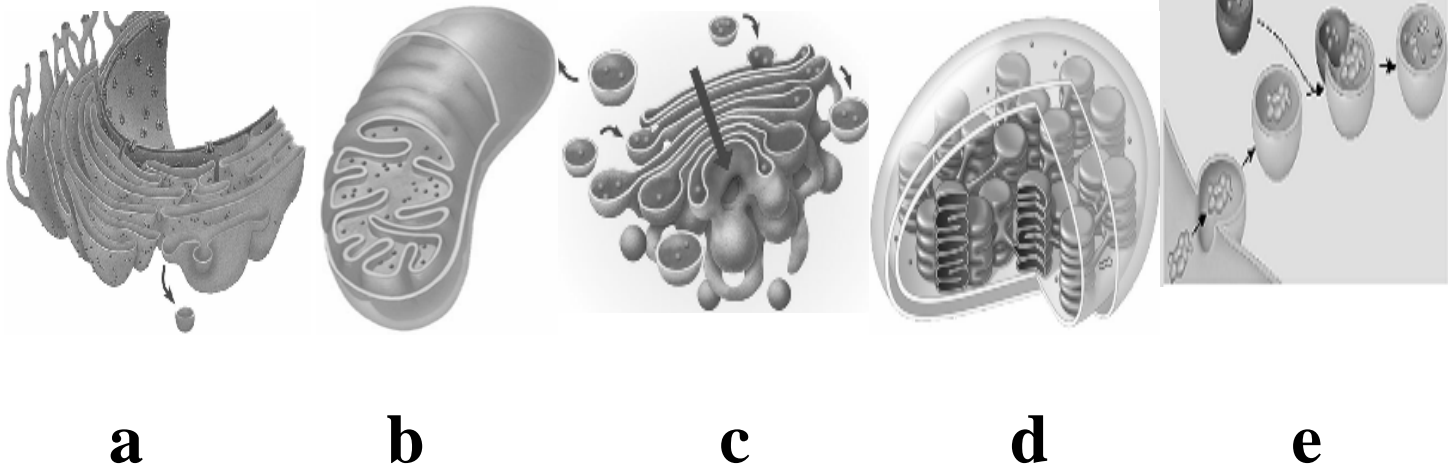
- A. single membrane
*B. double membrane
C. plasma membrane
D. thylakoid membrane
E. tonoplast



30. Which of the following pairs are in direct physical contact?

- *A. Nucleus / Endoplasmic reticulum B. Endoplasmic reticulum / Golgi apparatus
C. Golgi apparatus / Plasma membrane D. Endoplasmic reticulum / Lysosomes
E. Lysosomes / Plasma membrane

Refer to the following figures to answer questions 31-35



31. Not found in plant cells

- A. a B. b C. c D. d *E. e

32. Contains thylakoid membrane

- A. a B. b C. c *D. d E. e

33. Involved in packing and distribution of proteins

- A. a B. b *C. c D. d E. e

34. Components of the endomembrane system

- A. a, c and d B. b and d *C. a, c and e D. b, c and e E. a, b and d

35. The inner folds of organelle "b" are called

- *A. cristae B. matrix C. stroma D. grana E. cisternae

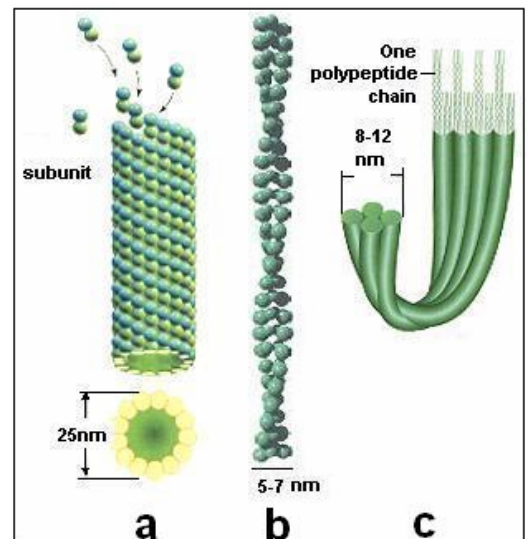
Refer to the figure to answer questions 36-37

36. Which structure forms the nuclear lamina?

- A. a B. b *C. c D. a and b E. b and c

37. Which structure is involved in chromosome movements during the cell division?

- *A. a B. b C. c D. b and c E. a, b and c



38. Which structure is responsible for lipid synthesis?

- A. peroxisome B. Golgi apparatus
C. central vacuole D. ribosome
*E. smooth endoplasmic reticulum

39. The general function of _____ is to rivet (fasten) cells together into a strong sheet.

- A. plasmodesmata *B. desmosomes C. gap junctions
D. ribosomes E. all of the above

40. _____ are the main components of the extra-cellular matrix.

- *A. Glycoproteins B. Phospholipids C. Cellulose
D. Cholesterol E. All of these