

THIS IS POSTED AS AN EXAMPLE (questions from exam one and two); MY LECTURE TOPICS CHANGE EACH YEAR SO QUESTIONS HERE MAY NOT REFLECT QUESTIONS ON YOUR FUTURE EXAM. FORM A STUDY GROUP TO GO OVER THE ANSWERS TO THESE QUESTIONS- IF YOU STILL CANNOT UNDERSTAND A QUESTION OR ANSWER, TALK TO OTHER STUDENTS, LOOK IN THE TEXT/YOUR LECTURE NOTES, OR SEE ME!! (UNDERSTAND QUESTIONS/ANSWERS DON'T MEMORIZE!)

Cell Biology 3611 Exam

The first 39 questions are to be recorded on the Scantron form (worth 1.74 pts each).

1. A nanometer is (more than one answer possible):  
a.  $10^{-9}$  meters      b.  $1000 \times 10^{-6}$  meters      c.  $0.001 \times 10^{-6}$  meters  
d.  $10^{-6}$  mm      e. one thousandth of a micron
2. A bacterium is about:  
a. one micron      b. 10000 mm      c. one mm      d. a nanometer
3. T F The naked human eye can see one typical human cell.
4. T F Without special techniques, the light microscope can see a cytoskeletal fiber.
5. T F Without special techniques, the light microscope can see a (typical) bacterium.
6. Complexes of proteins are typically:  
a. 25 nanometers      b. one nanometer      c. 5 nanometers  
d. 10 microns      e. 0.1 microns
7. We used examples of a "complex of proteins" called (more than one answer):  
a. ribosome      b. mitochondrion      c. insulin  
d. microtubule      e. DNA
8. T F Transmission electron microscopy looks at the outside of cells.

Answers for the next two questions:

a. E face      b. P face      c. B face      d. D face      e. varies so cannot list one answer

9. This face is next to the cytoplasm:

10. This face has most of the membrane proteins

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11. T F In biological molecules, nitrogen atom can have 3 bonds or 4 bonds. When the nitrogen atom has 4 bonds, it also has a positive charge.

12. T F Strong bonds are tough to break; it takes about 100 kcal to break one mole of them.

13. T F The major type of strong bond in the body is the covalent bond.

14. Noncovalent weak bonds have about \_\_\_ kcal/mol bond energy.  
 a. 10            b. 100            c. 0.1            d. 1            e. 50
15. T F The hydroxyl functional group contains only polar covalent bonds.
16. We talked about a hormone binding to its receptor through:  
 a. polar covalent bonds            b. hydrogen bonds            c. disulfide bridges
17. T F Fats are lipids and hydrophobic molecules.
18. T F One water molecule can form four bonds with its neighboring water molecules. This adds up to a tremendous force and makes water almost like a solid.
19. T F The molecules of water in ice are farther apart than the water molecules in liquid water. This is due to the fact that, in lower temperatures, the H bond is longer.
20. T F Water, being polar, cannot cross membranes.

Relate terms:

- a. nonspontaneous
  - b. positive  $\Delta G$
  - c. negative  $\Delta G$
  - d. spontaneous
  - e. at equilibrium (no work can be done)
21.  $\Delta G$  equals zero.
22. hydrolysis(two answers)
23. Needs ATP breakdown to drive (two answers)
24. Our chemical reactions are never .....
25. Dehydration synthesis(two answers).
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26. T F The C terminus is where the carboxyl group and the first amino acid are located.
27. The backbone of a glycolipid (where a sugar chain is attached to a lipid) is:  
 a. sphingosine            b. glycerol            c. terpene            d. fatty acid  
 e. peptide
28. From the end of chapter 1 questions: Assuming that a membrane is about 10 nm wide, how many membranes would have to be stacked side by side to be seen by a light microscope?  
 a. 2    b. 10    c. 20    d. 100    e. 2000
29. From the articles in the back of our course packet and lecture: a derivative of one amino acid can cause heart attacks:  
 a. glutamic acid            b. tyrosine            c. cysteine

From the end of chapter questions: use these answers:

- a. globular protein    b. cellulose    c. fibrous protein    d. phosphodiester bond
30. beta linkage

- 31. tertiary structure
  - 32. lipid
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33. From the end of chapter questions: hydrogen bond stabilizes what levels of protein structure? (more than one answer possible)

- a. primary
- b. secondary
- c. tertiary
- d. quaternary

34. From the end of chapter questions: the beautician first treats your hair with a:

- a. reducing agent
- b. oxidizing agent

35. T F From the end of chapter questions: double bonds in lipids induce a bend in the carbon chain (these are healthier lipids).

Use these answers:

- a. zinc
- b. tyrosine
- c. glutamic acid
- d. arginine

36. The attacking group on carboxypeptidase A is the:

37. The negatively charged C terminus of the substrate binds to the active site (not the +N terminus) because this positively charged amino acid is at the end of the active site:

38. This amino acid pulls on the peptide bond to be broken and this helps to break the bond.

39. T F Chemists will speed up a reaction by heating the mixture; this reduces the  $E_a$  barrier for the reaction. Enzymes also reduce the  $E_a$ .

-----end of Scantron

40 (3pts) . List the three types of work that we emphasized in lecture (do not use Fig from text):

- a.
- b.
- c.

41 (5). Draw a membrane (show how many layers are present, draw a phospholipid in the membrane, with our block diagram method showing how the parts are arranged). Use an X in a box for the charged group.

42 (3). Draw a peptide bond: show atoms and functional groups at the ends of the bond (you do not have to draw both amino acids). Point to the peptide bond itself. Circle the atoms that make up the imino group.

