Biology 150: 2nd in-class examination **Name**_____
March 3, 2014

Indicate the lab you are registered in:

Monday, 1-2:50 _____ ; Tuesday, 10-11:50 _____; Tuesday, 1-2:50 _____ ; Tuesday, 3-4:50 _____

Answer the questions in the space provided and you may also use the back of the page to complete your response. There are 25 questions worth a total of 50 points (plus four bonus questions). The point value of individual questions appears in parentheses.

1. Name the two types of nucleic acids. (1) Note: full names not the acronyms.

2. Draw the central sugar of a nucleotide. Number the carbons. Indicate where the purine or pyrimidine base is attached, the location of the phosphate(s), the carbon bound to the phosphate of the next nucleotide in a nucleic acid, and the carbon missing an O in one type of nucleic acid. (4)

3. What is the principle difference between eukaryotes and prokaryotes? (1)

4. Define the following: (3)
   (a) protoplasm

   (b) cytosol

   (c) cytoplasm

5. What structure forms the boundary between the nucleus and the surrounding cytoplasm? Describe its structure. (2)

6. In a eukaryote cell where do you find the nucleolus? What is its function? (2)

7. The endoplasmic reticulum is divided into two major types. Name them and indicate how their functions differ. (2)

8. Vesicles leaving the endoplasmic reticulum travel to what organelle? What happens there? What is the cisternal maturation model? (3)

9. Draw a mitochondrion. Label membranes, cristae, and matrix. (1)

10. Draw a chloroplast. Label membranes, thylakoids, stroma, and grana. (1)

11. What does a lysosome contain? (1)

12. What are proplastids? (1)

13. In a potato plant where would you find (a) chloroplasts, (b) chromoplasts, and (c) amyloplasts? (3)

14. What distinguishes microbodies from other organelles? Name two types of microbodies and indicate their functions. (2)

15. What three locations inside a plant cell can you find DNA? (1)

16. Briefly, what does the Endosymbiosis Theory propose? What evidence supports this idea. (4)
17. Intermediate filaments are composed of the protein_____, while microfilaments are composed of _____, and microtubules are composed of _____. (3)

18. Where would you find collagen and fibronectin? (1)

19. In the 1950's cell and organelle membrane structure was thought described by the unit membrane model. Describe that model. (2)

20. In 1970 S.J. Singer and G. Nicolson published what has evolved slightly to be the currently accepted model of the membrane. Name and describe their model. Also, how has the model changed since it was originally proposed? (4)

21. Define Osmosis. (1)

22. What will happen to a red blood cell in an isotonic solution? (1)

23. Name and describe the two types of facilitated diffusion transporters. Describe gating and selectivity. (2)

24. How do active and passive transport differ? (1)

25. Describe the function sodium/potassium pump. What is moved where? How is it "electrogenic"? (3)

Bonus questions:

(1) A nucleotide has guanine for a base and has two phosphates. What would its name be? (1) Note: full names not an acronym.(1)

(2) Most plants do not have centrosomes (the microtubule organizing center beside the nucleus does not contain centrioles). As well, these plants don't have cilia or flagella. How might one fact explain the other? (1)

(3) The first pheromone identified was bombycol. It is released by females of what kind of insect to attract males? (1)

(4) Dr. Wolf pointed out that the "tree of life" concept does not apply to prokaryotes. Why? (1)