

Intd 219
D. Iimoto

Exam I
140 pts.

October 7, 2003

Name _____

Directions: Please read question carefully before answering. Write as complete an answer as possible. Show your work to receive partial credit. Good luck!

(6 pts.) 1. Explain what the disease is in AIDS **and** describe what causes AIDS.

(6 pts.) 2. Describe the difference between a pandemic and an epidemic.

(6 pts.) 3. You have a friend who is sick with the common cold. He/she says that it is caused by viral cell. What reasons do you give him/her that explain that a virus is not a cell. (give two reasons)

(5 pts.) 4. How are proteins important to living systems?

(5 pts.) 5. Draw the structure of serine. The R group for serine is

(6 pts.) 6. In sickle cell anemia, how does the formation of hemoglobin polymers(molecules linked together) in the red blood cells of a person with sickle cell anemia cause the lack of oxygen delivery to the tissues?

(5 pts.) 7. Viruses contain nucleic acid at the core of the virus. The nucleic acid carries genetic information for the virus. What is this genetic information for?

(16 pts.) 8. Enzymes are important compounds in biological systems.

(3 pts.) A. What is the general function of an enzyme?

(3 pts.) B. Name the part of the enzyme that binds to the substrates (reactants).

(10 pts.) C. Name two enzymes that are part of the structure of HIV **and** describe what reactions they catalyze as part of the process that HIV uses to replicate itself.

(8 pts.) 9. Suppose that the following is the sequence of nucleotides on a DNA molecule. Assume that the bottom strand is the template strand used in transcription and that you start with the first nucleotide on the left.

A G G T C A A C T
T C C A G T T G A

(4 pts.) A. What is the sequence of nucleotides that is transcribed to make the mRNA

(4 pts.) B. What is the sequence of amino acids that is translated to make a protein polypeptide chain.

(8 pts.) 10. In the acronym AIDS, what does A stand for and why is it part of the name of the disease?

- (6 pts.) 11. What general factors determine the cell type a particular virus will infect.
- (8 pts.) 12. What cell type in the immune system does HIV prefer to infect **and** what specific factors determine why HIV infects this cell type?
- (5 pts.) 13. HIV is an example of a retrovirus. What is a retrovirus?
- (4 pts.) 14. In general, how do viruses cause disease?
- (3 pts.) 15. Which organ in the immune system is responsible for making the B and T lymphocytes?
- (3 pts.) 16. What is considered a very effective first line of defense against infectious agents?

(10 pts.) 17. Describe the response of the immune system once the Helper T cells have been activated by macrophages and how the response helps to eliminate viral infected cells from the body. Also explain how getting rid of viral infected cells helps to eliminate virus from the body.

(7 pts.) 18. What criteria is used by the CDC to define someone as having AIDS?

(6 pts.) 19. A friend comes to you and confides that he/she is infected with HIV. The person appears very healthy without any signs of the disease. He/she says the virus must be latent and sitting quietly in his/her cells and not doing anything. How do you respond?

(3 pts.) 20. What region of the world has the most number of HIV/AIDS?

(6 pts.)

21. Examine the maps at the back of the test. Calculate the incidence of HIV/AIDS in Eastern Europe and Central Asia over the two year period of 2001-2002.

(8 pts.)

22. Calculate the prevalence of HIV/AIDS in the total population of Kenya and Uganda. Which country has a higher prevalence of HIV/AIDS?