

Name _____

Directions: Please read each question carefully before answering. Give as complete an answer as possible and show your work to earn partial credit. Good luck!

(6 pts.) 1. What is the cause of AIDS and describe one risk factor associated with getting AIDS. Clearly differentiate between the two answers.

(6 pts.) 2. A friend comes to you and says that he/she is HIV+. He/she also said that he/she asked the doctor for antibiotics to treat his/her condition, but the doctor refused to give him/her the antibiotics. He/she is confused. How do you explain the doctor's decision to him/her.

(20 pts.) 3. The human immunodeficiency virus is composed of RNA and many proteins.

(4 pts.) A. The RNA contains many genes. What is the definition of a gene?

(4 pts.) B. When the HIV RNA is inside the infected cell, the enzyme reverse transcriptase catalyzes an important reaction. What is this reaction?

(8 pts.)

C. Once HIV's nucleic acid is integrated into the host's nucleic acid in the nucleus, the process of transcription and translation will occur. Suppose the following is part of the sequence of the DNA where the bottom strand is the template.

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

What is the sequence of nucleotides that will be transcribed starting from left to right?

What will be sequence of amino acids that will be translated?

(4 pts.)

D. Once HIV virions are assembled, what must the HIV virions do in order to cause disease?

(10 pts.)

4. In AIDS, it is the immune system that is destroyed. Specifically what part of the immune system is affected **and** how does destroying this part of the immune system disable the function of the immune system? Describe this in depth.

(3 pts.) 5. What stage of HIV/AIDS occurs within a couple of weeks of being infected with HIV and is characterized by flu like symptoms?

(6 pts.) 6. In the “Chronic Symptomatic HIV Disease” stage, describe what is happening to HIV and what is happening to the immune system.

(4 pts.) 7. In general, how are the AIDS drugs designed to work?

(8 pts.) 8. In HAART, how many drugs are given as the gold standard for treatment **and** what is the advantage to giving multiple drugs?

(9 pts.) 9. In the movie “And The Band Played On”, the blood bank industry was reluctant to agree to the recommendation of the CDC to test the blood supply for antibodies to hepatitis A as a means for screening for AIDS.

(3 pts.) A. What reason did the blood bank industry give for opposing the CDC recommendations?

- (6 pts.) B. Once HIV was discovered to be the cause of AIDS, the blood industry tested the blood supply using the ELISA and Western Blot tests between 1985-2002. What was the major reason why some HIV infected blood wasn't screened out?
- (20 pts.) 10. Prevention is a key weapon in controlling the spread of HIV/AIDS.
- (12 pts.) A. Suppose a friend came to you and confided that he/she had HIV/AIDS, but wasn't sure how he/she got the disease. You decide to inform him/her about how not to spread the disease to someone else. What do you recommend? (give **three** recommendations)
- (8 pts.) B. Another key prevention weapon is developing a vaccine to HIV. However, it has been difficult to develop an effective vaccine. Why? In your explanation, describe what part of the virus a traditional vaccine would target.

(8 pts.) 11. One of the major impediments to controlling the spread of HIV/AIDS is the lack of political will amongst government leaders. South Africa has been a prime example. Describe how the current government of South Africa has lacked political will (at least until very recently) and what they have and have not done in confronting HIV/AIDS.

(6 pts.) 12. The HIV/AIDS pandemic is costing the economies of many countries, particularly the hard hit African countries. What is the direct and indirect economic cost of HIV/AIDS to these countries? Make sure that you define which is direct and which is indirect.

(10 pts.) 13. Prevalence and death rates are key pieces of data that epidemiologists will track on any given disease.

(5 pts.) A. Calculate the prevalence of HIV/AIDS in Botswana in the total population.

- (5 pts.) B. Calculate the death rate of HIV/AIDS in Botswana per 100,000 total population.
- (3 pts.) 14. Which country in Africa has actually reduced its prevalence of HIV/AIDS during the last ten years?
- (3 pts.) 15. Of the four leading types of cancer in the United States, which one is the least curable and has the highest percentage of deaths after one year of diagnosis?
- (8 pts.) 16. What stage of the cell cycle is different in cancerous cells versus normal cells, **and** describe the purpose of that stage of the cell cycle **and** what normally controls that part of the cell cycle.
- (6 pts.) 17. What happens in the initiation stage of carcinogenesis, **and** name one factor that can cause the initiation stage to begin.

(8 pts.)

18. Compare and contrast surgery to chemotherapy as a form of treatment for cancer. In other words describe the pros and cons of each.

(6 pts.)

19. Match the diseases discussed in the presentations with the appropriate description below by writing the letter of the description next to the disease.

Ebola _____

Lupus _____

HPV _____

Parkinson's Disease _____

Diabetes _____

Small Pox _____

- a. Characterized by the degeneration of neurons that leads to lack of dopamine in the brain and can result in tremors.
- b. Characterized by the lack of ability to transport sugar/glucose into cells and can be treated with injections of insulin.
- c. Caused by a virus and usually results in massive bleeding.
- d. The only infectious disease eradicated from the human population.
- e. Caused by a virus that causes warts on the skin in the genitalia.
- f. Characterized by rashes on the skin associated with degeneration of tissues and is considered an autoimmune disease.