Homework Assignment 3 (25 points) Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MCB 2010C- Gessner Due date: October 29, 2016

Read Chapter 6 and answer the following questions:

1. Rewrite each of the following statements about viruses to make each sentence true (1/2 point each):

 a) Viruses are smaller than bacteria, and have diameters measured in micrometers.

 b) Each virus particle contains DNA and RNA.

2. Define each of the following (1 point each):

 a) Naked virus:

 b) Capsomere:

 c) Bacteriophage:

 d) Prophage:

3. In which kingdom are viruses classified (1 point)?

4. Most viruses can only infect only a narrow host range or organisms; explain why this is true. (1 point)

5. Animal cell viruses go through six general phases to multiply: adsorption, penetration, uncoating, synthesis, assembly and release from the host cell. Read about and be able to explain all six and then **explain what is assembled** during the “assembly phase.” (1 point)

 What are the two methods viruses use to penetrate the cell membrane of a host cell?

(1/2 point each)

 a)

 b)

6. Watch the linked Nova Science Now video (click on the forward arrow under 1918 Flu when the linked

 page appears) and answer the following questions.

[*http://www.pbs.org/wgbh/nova/body/1918-flu.html*](http://www.pbs.org/wgbh/nova/body/1918-flu.html)

a) What is the function of the H gene of the flu virus? (1 point)

b) What is the function of the N gene of the flu virus? (1 point)

c) Dr. Tumpey’s work is concerned with comparisons between the 1918 flu pandemic and the 2006 avian flu. What was the H\_N\_ designation for the 2006 avian flu? (1/2 point)

H \_\_ N \_\_

d) Why isn’t the 2006 avian flu currently as likely to cause a pandemic like the 1918 flu pandemic? (1/2 point)

7. How does the structure of a prion differ from the structure of a virus? (1 point)

Read Chapter 7 and answer the following questions:

8. If a bacterial cell has a generation time of 15 minutes, how many bacterial cells would that one bacterium ultimately produce after 3 hours? (Show your work) (1 point)

9. The term “normal microbiota” refers to what? (1 point)

10. Fill in the following: (1/2 point each)

a) Autotrophs use inorganic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as their carbon source.

b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are free-living microbes that feed primarily on organic detritus from dead organisms.

c) Bacteria that use oxygen gas for their metabolism, but which can also grow in the absence of oxygen gas are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 d) Bacteria that grow well in high concentrations of salt and sugar are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. Scientists are particularly interested in studying psychrophiles that can grow throughout the Arctic and Antarctic as well as the deepest parts of the ocean because these bacteria may suggest that bacteria can survive where? (1 point)

Read Chapter 11 and answer the following questions:

12. For each of the following, write whether the method would best be used to sterilize, sanitize, disinfect or be used as an antiseptic. (1/2 point each)

 a) Boiling water:

 b) Pasteurization:

 c) Autoclave:

 d) Incineration:

 e) Hot air oven at 120°C for one hour:

 f) Gamma radiation:

 g) High concentrations of salt and sugar:

 h) Common household bleach:

 i) Betadine:

 j) Hibiclens (chlorhexidine):

 k) Ethanol:

 l) 3% hydrogen peroxide:

 m) Soap:

 n) Ethylene Oxide gas:

 \_\_\_\_\_\_\_\_/25 points = \_\_\_\_\_\_\_\_\_\_%