Disclaimer: Not ALL of the questions on the midterm will necessarily be found on this document. The Study Questions you have been answering for each chapter are the basis for the midterm questions, but in order to phrase a logical multiple choice question, i.e. how the question is asked, it may be worded differently – the answer will remain the same.

Chapter 13 Viruses

1. What factor primarily determines the host range for a particular virus?

2. List the different methods that can be used to grow animal viruses in a laboratory.

3. What is a phage? What is a prophage? Diagram and explain the basic difference between the lytic cycle of phage multiplication and the lysogenic cycle.
4. Provide a named example of a virus that has an envelope. Describe the composition of the viral envelope. When and where are viral envelopes acquired? Provide a named example of a virus that has spikes and describe the role of the spikes of a virus. What factor primarily determines the host range for a particular virus?

5. What is a provirus? Provide an example of a latent viral infection.

6. Explain the difference between +RNA and –RNA viruses. Which enzyme do most - RNA viruses carry with them inside their capsids, and why? Provide examples of both type of virus.

7. How does the biosynthesis of the retroviridae differ from that of other viruses?

8. What are prions and how are they transmitted? Diagram and explain the pathology of prion diseases. Provide four named examples of prion diseases.
9. Construct a table in which you provide examples of each of the following types of viruses: enveloped DNA virus, and non-enveloped DNA viruses, enveloped RNA virus, and non-enveloped RNA viruses, a retrovirus.

Chapter 18 Vaccines

1. Provide examples of the following types of vaccines; attenuated whole agent, inactivated whole-agent, subunit, conjugated, and toxoid vaccines.

2. What are toxoid vaccines and what do they protect you against? Which three diseases does the infant DTaP vaccine protect children against?

3. How do subunit vaccines differ from traditional vaccines?
4. Why are you asked if you suffer from egg allergies before you receive the flu vaccine?

Chapter 14 Epidemiology

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<th>Provide Definitions for the following terms</th>
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<td><strong>Epidemiology</strong></td>
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1. Provide definitions for the terms communicable and non-communicable. Provide examples of communicable and non communicable bacterial diseases.

2. What are fomites? And provide a description of the role of a fomite in the transmission of a specific disease.
3. Explain the difference between signs of a disease and symptoms of a disease. During a case of influenza identify the signs and symptoms that you would experience.

4. Explain the difference between droplet transmission and airborne transmission. Provide examples of diseases

5. Explain the difference between direct contact and indirect contact as modes of disease transmission. Provide examples of diseases spread by each.

6. Diagram and describe the five stages of a disease.

7. Provide definitions of the following terms; endemic, epidemic, pandemic, and sporadic. Use examples of named disease to explain the difference between an endemic disease, and an epidemic disease.
8. What are vectors of disease transmission? Explain the difference between biological and mechanical transmission. Provide two examples of vectors and the diseases they spread.

9. Explain the difference between a primary infection and a secondary infection. Use an example to demonstrate your understanding of the term opportunistic pathogen.
Chapter 15 Pathogenicity

1. What are the common portals of entry for microbial pathogens? Provide an example of a disease that enters the human body through each of the different portals of entry. Which of the portals of entry for microbial pathogens is the most frequently used during infections?

2. What is ID$_{50}$ and what is LD$_{50}$?

3. Which organism is responsible for Toxic Shock Syndrome? Describe the epidemiology of Toxic Shock Syndrome (when it first appeared, who did it affect, number of cases, mode of transmission), and the pathology of Toxic Shock Syndrome (virulence factors, affects on host)
4. Provide named examples of the three different types of bacterial exotoxin, and their effects on the host. Provide named examples of bacteria that produce each different type of exotoxin.

5. Construct a table in which you contrast bacterial endotoxins and bacterial exotoxins in terms of: metabolic product, chemistry, pyrogenic response, effect of antitoxin, and LD$_{50}$.

6. Describe the pyrogenic response to an endotoxin.
Chapter 16 Nonspecific Defenses

1. Describe 5 nonspecific host defenses that protect the mucosal surfaces and the blood stream from pathogenic invasion.

2. Which leucocytes are phagocytes, and describe the process of phagocytosis.

3. Compare the activities of the five different leukocytes.

4. What is the complement system? Describe how the complement system is activated, and describe the three different outcomes of activation of the complement system, (not the pathways).
Chapter 17 Adaptive Immunity

1. Provide definitions for the following terms; naturally acquired active immunity, artificially acquired active immunity, naturally acquired passive immunity, and, artificially acquired passive immunity. Provide examples of each.

2. Identify the following type of immunity; (a) immunity resulting from vaccination. (b) newborn babies receiving mothers antibodies across the placenta, or via breast milk.

3. Name and describe the five different classes of immunoglobulins.

4. Diagram and describe the changes that would be detected in antibody titer following primary exposure to an antigen and explain why secondary exposure results in a different response.
5. Explain the differences between $T_H$ (CD4) and $T_C$ (CD8) cells.

6. Diagram and describe the physical structure of an antibody, clearly labeling each structure. Which part (or parts) of the antibody is responsible for the specificity of the thousands of different antibodies we produce?

7. What do the letters MHC stand for? On which cells would you find MHC I and MHC II proteins? Describe the role of the MHC class I and class II proteins in humoral and cell-mediated immunity.

8. Diagram and describe precisely how an antibody would attach to a bacterium for example. Once an antibody-antigen complex forms list the six results that could occur during the immune system response.

9. In 1796 Edward Jenner completed the first successful vaccination trial. Review his experiment correctly identifying the antigen and the type of immunity achieved. Using your knowledge of adaptive immunity explain how his procedure protected his ‘volunteer’ from contracting smallpox.