Please answer the following questions in order. Good Luck.

1. Discovery of microbial agents attributed for the specific epidemics is a major milestone in scientific process. Please use **SARS** as an example to illustrate how **scientific discovery** of the **etiologic agent** has been done **at** the **very beginning** when the microbe was unknown in 2003. Please also **compare** this scientific journey to the etiologic agent of acquired immunodeficiency virus (**AIDS**) to be discovered since 1981 **(15 points)**

2. What are **major differences** between **virus** and **viroid (10 points)**?

3. Would you please describe the **virological similarities** and **differences** in "**retrovirus**" and "**hepatitis B virus**" **(10 points)**

4. Global increasing medical importance of the two bacteria: causing agent for **salmonellosis** and ***Staphylococus aureus*** have been documented since 1990s. Please point out clearly the major **bacteria characteristics** contributing the increasing **incidence** of these two diseases **(10 points)**

5. **Tuberculosis** is a world leading cause of death in infectious diseases. What are **important properties** of tuberculosis **bacteria** that are related to its **pathogenesis** and **public health** in recent two decades? How are the tubercule bacilli **diagnosed** in past years and modern time (15 points)

6. What are **replication differences** in **influenza A viruses** compared to **poliovirus**? Would you please explain why **influenza A** viruses can lead to **pandemics** whereas **poliovirus** is going to be **eliminated** worldwide in future years? (15 points)

7. Would you please use **solid examples** to support **why** certain microbial infections can lead to **recovery** but other agents result in **persistent infection** or **immunopathologic outcomes** (ie. one example each and total three examples)

   (10 points)

8. Ecology of microbes could be associated with subsequent microbial pathogenesis. Please use **one example** for **bacteria** and **another** example for **virus** to illustrate the roles of **microbial strain variation** in **ecology** and **pathogenesis** of infectious diseases **(15 points).**