1. Define the following terms and give examples (when applicable):
   a. Antibiotic: a product of one microorganism that is detrimental or inhibitory to other microbes in small amounts.
   b. Disinfectant: a chemical substance that destroys disease-causing microbes, applied to inanimate objects.
   c. Sterilization: the process of killing all microorganisms in a given area.
   d. Vaccine: a substance used to stimulate the production of antibodies and provide immunity, contains weakened or inactive microorganisms.
   e. Superbug (Drug Resistant): a disease-causing microorganism that has developed resistance to a particular chemotherapeutic agent.
   f. Desiccation: drying or removal of water - prevents bacteria reproduction.
   g. Disinfection: the process of destroying disease-causing microorganisms.
   h. Sulfonamide: antibacterial compounds containing sulfur. They were the first widely used chemotherapeutic agents.
   i. Chemotherapy: treatment of disease or symptoms with a chemical compound.
   j. Pasteurization: heating a beverage, or other food to a specific °T (less than boiling point) for a period of time in order to kill microorganisms that could cause disease.

2. What are the six different physical methods for controlling microbes? (Give a brief description for each):
   b. Pasteurization - does not sterilize (Definition above).
   c. Desiccation - bacteria may survive if embedded in mucus, pus, or feces.
   d. Radiation - kills microbes by destroying nucleic acids (Ionizing radiation, UV light).
   e. Filtration - removal of bacteria from a liquid by passing it through a filter with pores smaller than bacteria.
   f. Low Temperatures - prevents bacterial reproduction, but will not sterilize and can preserve (Lyophilization).

3. What are the two different ways an antibiotic works to fight an infection? Define each method.
   a. Bactericidal - kills the bacteria by preventing the bacteria from making a cell wall.
   b. Bacteriostatic - prevents bacteria from dividing (DNA synthesis, metabolism, and protein synthesis).
4. Describe the history behind the discovery of the first antibiotic. Alexander Fleming in 1928 was a messy scientist that noticed S. aureus would not grow where mold was present—developed Penicillin.

5. What do you call a hospital-acquired infection? **nosocomial infection**

6. List the four different common types of disinfectants and antiseptics.
   a. **Alcohols** - kills microbes by protein denaturation
   b. **Soaps and detergents** - surface active agents, mechanically remove bacteria
   c. **Hydrogen peroxide** - mildly antiseptic due to oxidizing ability
   d. **Halogens** - chlorine and iodine, 
      
7. Describe the three methods for heat sterilization.
   a. **Moist Heat** - steam under pressure, at 15 lb./in² above normal air pressure, the boiling point of H₂O is at 121°C
   b. **Boiling H₂O** - kill all vegetative cells, ineffective on endospores, addition of 2% Sodium bicarbonate to H₂O will raise boiling point and effectiveness on penetration of heat through object to be sterilized, requires much
   c. **Dry Heat** - effectiveness depends on penetration of heat through object to be sterilized, requires much

8. What are the rules for antibiotics? **Higher heat than moist heat or boiling H₂O**
   a. **Take antibiotics only when prescribed for you by your doctor.**
   b. **Take antibiotics for full length of time, recommended you should have none leftover.**
   c. **If you do have leftovers, do NOT save them for future use.**

   Used to sterilize items which would be damaged by H₂O.