

I. Define the following terms (2% each)

1. specialized transduction
2. transposon
3. Ames test
4. DNA transformation
5. tobacco mosaic virus
6. interferon
7. electron transport chain
8. Active immunity
9. bioremediation

II. Compare and contrast the following terms (4% each)

1. prototroph and auxotroph
2. icosahedral capsids and helical capsids
3. gram-positive and gram-negative cell walls
4. F and F' conjugation
5. Southern blot and Northern blot analysis
6. specific response and nonspecific immune response
7. pasteurization and sterilization
8. active transport and passive transport

III. Answer the following questions (10% each)

1. What are Koch's postulates and how Robert Koch identified the pathogen that causes anthrax?
2. Please describe the structure of the lactose operon in *Escherichia coli* and how transcription of this operon is regulated by lactose and glucose.
3. Name and define the five classes of bacteria according to the effect of oxygen on their growth.
4. What are the methods used to classify of bacteria, name at least five major characteristics of them.
5. Distinguish between Streptomyces, Ascomyces, diatom and lichen.