Directions: Please answer all questions AFTER CAREFULLY READING EACH WORD. Mark only one choice on the Scantron Answer Sheet. Write + mark in your Name (top) and Panther ID (bottom) on the Scantron Answer Sheet.

Multiple Choice Questions (3 points each)

1. Toxic shock syndrome is associated with:
   b. enterotoxin of \textit{Staphylococcus aureus}.  
   c. super antigen of Gram + coccus.  
   d. meningococcal capsular antigen.  
   e. whooping cough.

2. The major challenge in treating necrotizing fasciitis caused by \textit{Streptococcus pyogenes} is that:
   a. the bacterium is multidrug resistant.  
   b. no antibiotic is useful.  
   c. the toxin is a phage gene.  
   d. the causative agent is MRSA.  
   e. rapid necrosis of the tissue limits access.

3. Which of the following does not pertain to influenza?
   a. It is caused by an enveloped RNA virus.  
   b. It is not treated by antibiotics.  
   c. It is common world over.  
   d. Runny nose is a characteristic symptom.  
   e. Direct fomite transmission is significant in its spread.

4. The result of a tuberculin skin test for a person in the third year of AIDS showing symptoms of TB is:
   a. negative test.  
   b. positive test.  
   c. profuse bleeding.  
   d. ulcerative lesion.  
   e. any two of the above.

5. Why is antibiotic treatment not typically prescribed for staphylococcal food poisoning?
   a. The bacterium is multi-drug resistant.  
   b. No antibiotic works because it is a mixed-microbe-infection.  
   c. No vegetative cells are involved in the disease.  
   d. The causative agent in MRSA.  
   e. None of the above.

6. Which of the following is a correct pair?
   a. Koplick's spot - HIV induced cancer.  
   b. herd immunity - immunity of animals.  
   c. acetylcholine blocker - botulism toxin.  
   d. Lyme disease - enteric disorder.  
   e. enteric fever - elevated white blood cell counts.

7. __________ diseases are often called spongiform encephalopathies.
   a. Meningitis.  
   b. Cytotoxin.  
   c. Neurotoxin.  
   d. Prion.  
   e. Virus.

8. Which of the following is not correct about malaria?
   a. It infects over 300 million people/year.  
   b. It is highly communicatable host to host.  
   c. \textit{Plasmodium} species are the causative agents.  
   d. Free-iron toxicity is a mode of action of quinones.  
   e. Drug resistance is not a challenge.

9. A hunter who presents with flu-like symptoms and lives in Boston has a “bulls-eye” rash on his leg. The most likely diagnosis is:
   a. Lyme disease.  
   b. plague.  
   c. malaria.  
   d. measles.  
   e. meningitis.

10. The bacterium causing males to have painful urination (but never in females) is a:
    a. Gram positive rod that ferments.  
    b. Gram positive coccus that is catalase negative.  
    c. Gram negative coccus that is oxidase positive.  
    d. Gram negative rod that is oxidase negative.  
    e. unculturable spirochete.

11. Chocolate agar contains:
    a. H$_2$S.  
    b. autoclaved blood.  
    c. oxidase reagent.  
    d. chocolate.  
    e. Lactose.

12. Which of the following is best to be a new antibiotic target?
    b. Glycolysis.  
    c. Pyrimidine bases.  
    d. nuclear envelope.  
    e. ribosomes.

13. An antibiotic’s MIC is the:
a. the average concentration of the drug that will prevent growth of an organism.
b. the lowest concentration of the drug that will prevent growth of an organism.
c. the highest concentration of the drug that will prevent growth of an organism.
d. the mid-line concentration of the drug that will prevent growth of an organism.
e. any concentration of the drug that will prevent growth of an organism.

14. One of the leading sources of infection with antibiotic resistant bacteria is:
a. farm animal infections.  
b. locker room infections.  
c. dental surgery infections.  
d. nosocomial infections.  
e. food recall infections.

15. Beta-lactamase would cause the hydrolysis of:
a. aminoglycoside.  
b. ampicillin.  
c. tetracycline.  
d. bactracin.  
e. quinolone.

16. An abscess caused by Clostridium perfringens would best be collected and transported to the lab by:
a. aspiration into a oxygen filled tube.  
b. swabbed onto a blood agar plate.  
c. aspiration into a nitrogen filled tube.  
d. draining with a catheter into sterile distilled water.  
e. draining into a syringe.

17. Of the following body sites, which could contain the most bacteria in a healthy individual?
a. blood.  
b. urine.  
c. cerebrospinal fluid.  
d. nasopharynx.  
e. bladder.

18. Laboratory analysis of a patient suspected to have bacterial meningitis would be performed with which sample?
a. urine sample.  
b. blood draw.  
c. throat swab.  
d. lumbar puncture.  
e. sputum sample.

19. John Snow, the “Father of Epidemiology” is know for deducing the source of which causative agent in the 1854 London disease outbreak?
a. Shigella dysenteriae.  
b. Vibrio cholerae.  
c. Haemophilus influenzae.  
d. Yersinia pestis.  
e. Clostridium tetani.

20. Which infectious disease is on the CDC bioterrorism list because the general population has not been vaccinated for the disease since 1970s?
a. bubonic plague.  
b. rabies.  
c. tuberculosis.  
d. smallpox.  
e. EBOLA virus.

22. Compared to eutrophic lakes, the BOD of oligotrophic lakes is:
a. low.  
b. high.  
c. same.  
d. unpredictable.  
e. extremely high.

23. The salt concentration of sea water is about 3.5%/ Which of the following is not a major ion in sea water?
b. Cl⁻.  
c. Mg²⁺.  
d. SO₄²⁻.  
e. Fe²⁺.

24. The best description for microbial communities in the deepest part of the oceans is:
a. thermophilic.  
b. psychrotrophic.  
c. barophilic thermophiles.  
d. barophilic psychrophiles.  
e. none of these, the bottom is sterile.

25. Microbes are vital in which step of wastewater treatment?
a. preliminary  
b. primary.  
c. secondary.  
d. tertiary.  
e. none of these.

26. Which type of microbe carries out nitrification?
a. lithotrophs.  
b. heterotrophs.  
c. chemooorganotrophy.  
d. phototrophs.  
e. fastidious heteroptrophs.

27. Which of the following is assimilated almost entirely in the oxidized state?
a. sulfur.  
b. nitrogen.  
c. phosphate.  
d. carbon.  
e. sodium.

28. The major floc forming bacterium in sewage treatment is:
a. Escherichia.  
b. Salmonella..  
c. Zooglea.  
d. Nostoc.  
e. Bacillus.

**Written Answer Questions.** Be sure to include units with numerical answers, number answers without units get zero points. Be sure to underline Genus species names.
1. **List** the major steps in the disease syphilis and indicate when they occur. Note: do not write sentences or paragraphs, that will result in zero points. (6 points).

2. Diagram the Nitrogen Cycle. For each step provide the name of the step and a Genus that can carry that out. (10 points)