SAMPLE EXAMINATION QUESTIONS

The questions below are illustrations of both the form and content of questions. Examples are provided from different sections of the course. The questions are prepared in the same format as are used in the National Boards.

Question type: Single best answer. Select one answer.

1. Which type of mutation results in the failure to synthesize an amino acid?
   a. nonsense
   b. deletion
   c. missense
   d. regulatory
   e. antisense

2. Which type of mutation can be suppressed by a mutated tRNA gene?
   a. nonsense
   b. deletion
   c. missense
   d. regulatory
   e. antisense

3. Which bacterial component is unique to Gram-positive rods?
   a. Penicillin-binding proteins
   b. Porins (outer membrane proteins)
   c. Spores
   d. Flagella
   e. Mesosomes

4. Which bacterial component is involved in cell wall assembly?
   a. Penicillin-binding proteins
   b. Porins (outer membrane proteins)
   c. Spores
   d. Flagella
   e. Mesosomes

5. Which bacterial component is necessary for transport of solutes across the outer membrane?
   a. Penicillin-binding proteins
   b. Porins (outer membrane proteins)
   c. Spores
   d. Flagella
   e. Mesosomes
6. Which toxin acts on the neuromuscular junction by inhibiting the release of acetylcholine?
   a. Cholera
   b. Tetanus
   c. Botulism
   d. Diphtheria
   e. Enterotoxin

7. Which toxin interferes with protein synthesis by preventing peptide elongation?
   a. Cholera
   b. Tetanus
   c. Botulism
   d. Diphtheria
   e. Enterotoxin

8. A 48 year old male who had an aortic valve replaced 2 months ago presents with symptoms of endocarditis. Which of the pathogens below would be the most likely pathogen?
   a. S. aureus                      f. L. monocytogenes         k. S. sonnei
   b. S. epidermidis                  g. E. coli                      l. C difficile
   c. Gp. A streptococcus           h. K. pneumonia                   m. B. fragilis
   d. H. influenzae                  i. P. aeruginosa                 n. Viridans streptococci
   e. N. meningitidis               j. E. faecalis                  o. C tetani

9. A 78 year old male on antibiotic (a cephalosporin) therapy for pneumonia develops profuse diarrhea in the hospital. Which of the pathogens below would be the most likely pathogen?
   a. S. aureus                      f. L. monocytogenes         k. S. sonnei
   b. S. epidermidis                  g. E. coli                      l. C difficile
   c. Gp. A streptococcus           h. K. pneumonia                   m. B. fragilis
   d. H. influenzae                  i. P. aeruginosa                 n. Viridans streptococci
   e. N. meningitidis               j. E. faecalis                  o. C tetani

10. Match the fungus *Histoplasma capsulatum* with the most consistent clinical setting:
   a. A 35 year old AIDS patient develops fever, headache and a positive India ink preparation of his cerebrospinal fluid.
   b. A 44 year old stockbroker who is an avid weekend gardener develops a hard nodule on his forearm with red streaks radiating upward.
   c. A 50 year old Filipino man living in San Diego, California, develops severe left arm and elbow pain, with x-ray showing destruction of the proximal humerus and joint space.
   d. A 24 year old pregnant woman develops a white vaginal discharge and severe perineal pruritus.
   e. A 75 year old subsistence farmer in Indiana develops fever
11. Match the fungus *Sporothrix schenckii* with the most consistent clinical, insidious weight loss and a pattern on chest x-ray that resembles miliary tuberculosis. setting:

a. A 35 year old AIDS patient develops fever, headache and a positive India ink preparation of his cerebrospinal fluid.
b. A 44 year old stockbroker who is an avid weekend gardener develops a hard nodule on his forearm with red streaks radiating upward.
c. A 50 year old Filipino man living in San Diego, California, develops severe left arm and elbow pain, with x-ray showing destruction of the proximal humerus and joint space.
d. A 24 year old pregnant woman develops a white vaginal discharge and severe perineal pruritus.
e. A 75 year old subsistence farmer in Indiana develops fever, insidious weight loss and a pattern on chest x-ray that resembles miliary tuberculosis.

12. Which of the following is the most effective type of vaccine presently available to prevent measles?

a. Live attenuated vaccine  
b. Formalin killed vaccine  
c. Recombinant antigen vaccine  
d. Polysaccharide vaccine  
e. Polysaccharide-protein conjugate vaccine

13. Which of the following is the most effective type of vaccine presently available to prevent *Hemophilus influenzae*?

a. Live attenuated vaccine  
b. Formalin killed vaccine  
c. Recombinant antigen vaccine  
d. Polysaccharide vaccine  
e. Polysaccharide-protein conjugate vaccine

14. In clinical settings, the acquisition of multiple antibiotic resistance by enteric gram-negative bacteria most often involves

a. conjugative plasmids.  
b. generalized transducing phage.  
c. nonconjugative plasmids.  
d. spontaneous mutation.  
e. transformation by R-factor DNA.

15. A 1 year old boy is admitted on January 25th to Columbia Presbyterian Medical Center with 7% dehydration. The mother states that he has had a low grade temperature, one day of vomiting and 2 days of diarrhea. He is having approximately 10 watery stools/day. There is no blood or mucous in the stool. His playmate is also ill, but all the parents are well. The most likely agent is:

a. An Enterovirus  
b. Norwalk virus  
c. *Campylobacter spp.*  
d. Shigella  
e. Rotavirus
16. A 30 year old woman has a urinary tract infection caused by *Escherichia coli*. She has a history of allergy to penicillin and sulfa drugs. The physician elects to treat the patient with oral tetracycline, 250 mg, four times daily for 10 days. It is appropriate to advise the patient

a. to avoid the use of antacids.
b. to avoid alcoholic beverages.
c. to take the drug with milk.
d. that the urine may take on an orange hue.
e. that a rash due to cross-reactivity to sulfonamides may occur.

17. Which one of the following statements about occupational exposures to HIV is true?

a. AZT is uniformly effective in preventing HIV infection following a needle stick.
b. Recapping of needles is essential because it reduces the incidence of needle sticks among housekeeping staff emptying receptacles.
c. A needle stick carries approximately a 1/50 chance of transmitting HIV.
d. No documented cases of occupational acquisition of HIV have yet occurred.
e. The risk of acquiring HIV from a needle stick is significantly less than that of acquiring hepatitis B.

18. You are beginning to educate a new patient with HIV about the risk of opportunistic infections. You explain that because his CD4 count has dropped to 185 you will need to institute antimicrobial prophylaxis against which of the following pathogens (in addition to initiating his antiretroviral therapy)?

a. *Pneumocystis jiroveci* (formerly *carinii*)
b. *Cryptococcus neoformans*
c. *Toxoplasma gondii*
d. *Mycobacterium tuberculosis*
e. *Mycobacterium avium* complex (MAC)

19. The adenovirus E1A and E1B genes are thought to participate in oncogenesis by which of the following mechanisms.

a. Insert in the host DNA and upregulate cellular oncogenes.
b. Contribute to recombination between various gamma globulin promoters and cellular oncogenes.
c. Inactivate antioncogenes such as the retinoblastoma and p53 genes by binding to the protein products of each of these genes.
d. Increase growth factor receptor genes on the cell surface.
e. Activate a cascade of transforming events by increasing the level of tyrosine kinases.

20. The mode of transmission of *Chlamydia trachomatis* is:

a. inhaled droplet
b. waterborne
c. person to person contact
d. fomite
e. foodborne
ANSWERS TO SAMPLE EXAMINATION QUESTIONS

1. A
2. C
3. C
4. A
5. B
6. C
7. D
8. B
9. L
10. E
11. B
12. A
13. E
14. A
15. E
16. A
17. E
18. A
19. C
20. C