1. Which of the following describes the chemical characteristic of an antibody?
   a. carbohydrate
   b. lipid
   c. protein
   d. electrolyte
   e. ligand

2. In quantitative immunoassays the single most important factor responsible for success or failure is:
   a. specificity
   b. affinity
   c. titer
   d. monoclonal property
   e. antibody absorption

3. Immunonephelometry is based upon the principle that:
   a. antigen and antibody form complexes in antigen excess
   b. antigen and antibody react to form precipitin line
   c. antigen and antibody form small complexes in antibody excess
   d. antigen and antibody form large complexes which precipitate
   e. antigen and antibody form large lattice structures which precipitate

4. Which of the following describes a sandwich fluoroimmunoassay?:
   a. reagent antibody (solid phase) + antigen in patient sample, incubate, + fluoroscein labeled anti-antigen
   b. reagent antibody (solid phase) + antigen in patient sample, incubate, + fluoroscein labeled anti—antibody
   c. reagent antibody (solid phase) + antigen in patient sample, incubate, + fluoroscein labeled indicator antigen
   d. reagent antibody (solid phase) + antigen in patient sample + fluoroscein labeled antiantigen, incubate, + indicator antigen
   e. reagent antibody (solid phase) + indicator antigen, incubate, + fluoroscein labeled anti—antigen

5. In double diffusion, immune precipitation reactions occur when two lines cross each other: The reaction is one of:
   a. antigen identity
   b. identity
   c. partial identity
   d. antibody identity
   e. non-identity

Use the following Key to answer Questions 6 – 24.
   a. 1,2, and 3 are correct
   b. 1 and 3 are correct
   c. 2 and 4 are correct
   d. only 4 is correct
   e. all are correct
6. Which of these are precipitin based assays?
   1. Ouchterlony
   2. ELISA
   3. immunoelectrophoresis
   4. complement fixation

7. Which of the following factors affects antigenicity?
   1. chemical nature
   2. size
   3. conformation
   4. genetics

8. Which of the following describe the properties of an antibody?
   1. has H & L chain
   2. can be degraded into Fab and Fc fragments
   3. has V and C regions
   4. has J chain

9. Antibody affinity describes:
   1. heterogeneity of antibody
   2. closeness of fit
   3. diversity of antibody
   4. the association constant

10. Cross-reactivity
    1. usually involves low affinity antibodies
    2. is often found in crossed immunoelectrophoresis gels
    3. is often observed between similar antigenic determinants
    4. is the most important reaction in nephelometry

11. Antigen-antibody precipitation reactions occur because:
    1. both molecules are multivalent in nature
    2. large complex lattices are formed
    3. antibody and antigen are at equivalence
    4. antigen is present in excess

12. Radial immunodiffusion is a technique:
    1. which quantifies antigens
    2. which requires a mono-specific antibody solution
    3. which results in the formation of precipitin rings
    4. which measures antigen equivalence

13. Antigens present in biological fluids are subject to degradation depending upon:
    1. nature of the antigen
    2. concentration
    3. stability to storage conditions
    4. susceptibility to enzymes

14. Agglutination reactions are:
    1. dependent upon antigen bridging between antibody molecules
2. dependent upon formation of antibody bridges between antigen particles
3. dependent upon the positive charge of the latex bead
4. usually best done using IgM reactions

15. Complement fixation assays:
   1. are more efficient with IgM than with IgG
   2. do not work with all classes of IgG
   3. make holes in the membranes of target cells
   4. results are read from aggregates of red cells

16. Which of the following are indicator molecules for immunoassays?:
   1. enzymes
   2. fluorescing molecules
   3. radionuclide
   4. absorbing molecules

17. Microtiter or ELISA readers:
   1. are spectrophotometers adapted to read small volumes
   2. can rapidly read 96 samples
   3. are spectrophotometers adapted to read titers
   4. are optical character readers for microtiter plates

18. The Western Blot technique involves:
   1. electrophoresis of proteins in polyacrylamide or agarose
   2. transfer of separated proteins to nitrocellulose
   3. detection of individual species of proteins by immunoassay
   4. detection of very low levels of individual proteins

19. The sandwich technique with labeled antibody that is used for antibody measurement:
   1. has three layers
   2. has two layers
   3. has antigen (1st layer), antibody (second layer), and second antibody with enzyme label (third layer)
   4. has antibody (1st layer) and second antibody with enzymelabel (second layer)

20. Substances that are known to interfere with immunoassays are
   1. compounds that are chemically similar to the antigen
   2. sample matrix
   3. heterologous antibodies that react with the reagent antibody
   4. hemoglobin

21. An heterogeneous, competitive binding immunoassay requires
   1. labeled antigen
   2. separation of the bound label
   3. excess antibody
   4. a large antigen with multiple binding sites
22. A non-competitive immunoassay is characterized by
   1. sandwich formed between antigen and antibody
   2. possible high dose hook at high antigen concentrations
   3. not applicable to small molecules
   4. excess antibody reaction

23. Which of the following are associated with nephelometric immunoassays?
   1. small immune complexes are formed by the unknown antigen and reagent antibody
   2. polyethylene glycol prevents complex formation
   3. light scatter is proportional to antigen concentration
   4. antigen excess

24. Measures that can be instituted to improve specificity of an assay include
   1. purify the antiserum by absorption techniques
   2. use sandwich technology
   3. select an antibody which binds an unique epitope on the antigen
   4. use chemiluminescent molecules as label

Answer:
   1. c (p. 219)
   2. a (p. 230)
   3. c (p. 232-233)
   4. a (p. 239-241)
   5. e (p. 225)
   6. b (p. 225,231)
   7. e (p. 217-218)
   8. a (p. 219-220)
   9. c (p. 222)
   10. b (p. 222-223)
   11. a (p. 223-224)
   12. a (p. 225)
   13. e (p. 230-231)
   14. c (p. 234)
   15. a (p. 236-237)
   16. a (p. 238)
   17. b (p. 239-240)
   18. e (p. 231-232)
   19. b (p. 239)
   20. a (p. 229-231)
   21. a (p. 240)
22. e (p. 239)
23. b (p. 232-233)
24. a (p. 229-231)