**Chapter 6**
**Immunology**

**1.** Which of these tracings are the role of T-cell receptor complex?
**(A)** α and β chain **(B)** CD19
**(C)** CD3 **(D)** CD40L

**2.** Which of the following steps are involved in the activation of T-cell?
**(A)** Double positive cell converts to single positive T-cell
**(B)** Foreign peptide bound to MHC provide signals
**(C)** CD28 of TCR interacts with B7 of APC
**(D)** CD23 has ITAM, which transducer signals

**3.** Allogenic transplant relates to
**(A)** stem transplant to related donors.
**(B)** bone marrow transplantation to unrelated donors.
**(C)** stem transplant for cancer patient.
**(D)** paired donation.

**4.** Agammaglobulinemia relates to the
**(A)** blockage of the growth of B-lymphocytes.
**(B)** high concentration of antibodies.
**(C)** X-linked.
**(D)** autosomal recessive.

**5.** Which of the following are autoimmune diseases?
**(A)** Rheumatoid arthritis **(B)** Agammaglobulinemia
**(C)** Juvenile diabetes **(D)** Addison disease

**6.** Example of a type II immune complex disease is
**(A)** Myasthenia gravis. **(B)** Graves' disease.
**(C)** Serum sickness. **(D)** Graft rejection.

**7.** Major histocompatibility complex (MHC) gene polymorphism and alleles are associated with increased susceptibility of certain diseases. One of the alleles, B47 which is associated with
**(A)** Ankylosis spondylitis. **(B)** Reactive arthritis.
**(C)** Reiter's syndrome. **(D)** Myasthenia gravis.

**8.** The following is the characteristic feature of peptide binding cleft for MHC class I proteins:
**(A)** It consists of alpha 1 and alpha 2 subunits
**(B)** The pocket can bind to 8– 10 amino acid peptide
**(C)** It is a close-ended pocket
**(D)** It presents exogenous antigens

**9.** Transporter associated with antigen processing (TAP) is involved in the transport of the antigenic peptide from the cytosol to endoplasmic reticulum. Which of the following the correct answer?

**(A)** TAP 1 and TAP 2 are class of ABC binding cassette proteins required for transport of processed peptide and they are highly polymorphic

**(B)** The TAP 2 protein has one hydrophilic region and one ATP-binding region

**(C)** TAP has the highest affinity for a peptide containing 8– 10 amino acids and favors hydrophobic amino acids

**(D)** Define mutation of TAP proteins lead to immunodeficiency and autoimmunity

**10.** The properties of CD1, a non-classical pathway for antigen presentation is

**(A)** similar to MHC class I, CD1 interacts with $\beta_2$ microglobulin.

**(B)** the genes are located in chromosome 1.

**(C)** the antigen-binding site for CD1 is deeper and voluminous.

**(D)** the presentation of lipid antigens to B cells.

**11.** Which of the following statements about antigen-antibody (Ag-Ab) complexes is (are) TRUE?

**(A)** Hydrogen bonds and van der Waals forces participate in Ag-Ab interactions

**(B)** Ionic bonds and hydrophobic bonds participate in Ag-Ab interactions

**(C)** The combined strengths of all interactions between a single antigen binding site on an antibody
and a single epitope is called avidity

**(D)** Antibody elicited by one antigen can cross react with an unrelated antigen

**12.** Identify the autoimmune diseases among the following.

**(A)** Type II Diabetes Mellitus **(B)** Type I Diabetes Mellitus

**(C)** Gestational Diabetes **(D)** Pernicious Anemia

**13.** The cells involved in allergic reactions and containing surface receptors of IgE antibodies and histamine are

**(A)** basophils. **(B)** mast cells.

**(C)** monocytes. **(D)** neutrophils.

**14.** Antibody binds to antigen in solution through

**(A)** ionic interactions. **(B)** hydrogen bonds.

**(C)** van der Waals interactions. **(D)** hydrophobic interactions.

**15.** Which of the following cell types can develop from myeloid lineage?

**(A)** Macrophages **(B)** T-lymphocytes

**(C)** B-lymphocytes **(D)** Erythrocytes

**16.** Which of the following is(are) involved in the activation of cytotoxic T-cells?

**(A)** MHC I **(B)** FcR

**(C)** T-cell receptor **(D)** CTLA 4

**17.** Gene rearrangements in which of the following cell types lead to antigen receptor diversity in immune cells?

**(A)** Macrophages **(B)** B-cells

**(C)** NK cells **(D)** T-cells

**18.** Bacterial superantigens
**(A)** bind to V$\beta$CDR2 loop in T cells without being processed into peptides
**(B)** bind to V$\beta$CDR2 loop in T cells after being processed into peptides
**(C)** are recognized by B cells after being processed into peptides
**(D)** binds to V$\beta$CDR1 and HV4 loops in T cells without being processed into peptides

**Answer Key**

**1. (A), (C), (D)**
**2. (B), (C), (D)**
**3. (A), (B), (C)**
**4. (A), (C), (D)**
**5. (A), (C), (D)**
**6. (A), (B)**
**7. (A), (B), (C)**
**8. (A), (B), (C)**
**9. (A), (C), (D)**
**10. (A), (B), (C)**
**11. (A), (B), (D)**
**12. (B), (D)**
**13. (A), (B)**
**14. (A), (B), (C), (D)**
**15. (A), (D)**
**16. (A), (C)**
**17. (B), (D)**
**18. (A), (D)**