JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- MARCH-2023

Course Code (Credits): 20MS1BT212 (3) Max. Marks: 15

Course Name: Immunology

Course Instructors: Dr.Abhishek Max. Time: 1 Hour

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

1. Compare and contrast the four types of antigen-binding molecules used by the immune system—antibodies, T-cell receptors, class I MHC molecules, and class II MHC molecules in terms of the following characteristics: [3]

    a. Specificity for antigen
    b. Types of antigen recognized

2. How might an arthropod, such as a cockroach or beetle, protect itself from infection? In what ways might the innate immune responses of an arthropod be similar to those of a plant and how might they differ? [2]

3. Indicate whether each of the following statements is true or false. If you think a statement is false, explain why. [3]
    a. All TH cells express CD4 and recognize only antigen associated with class II MHC molecules.
    b. Only antigen-presenting cells express class MHC-I molecules, whereas nearly all cells express class MHC-II molecules.
    c. Activation of macrophages increases their expression of class I MHC molecules, making the cells present antigen more effectively.

4. The role of antigen becomes critical when it interacts with and activates mature, antigenically committed T and B lymphocytes, bringing about expansion of the population of cells with a given antigenic specificity. In this process of clonal selection how the highly specific T cell, B cell, Memory cell and antigenically committed T and B lymphocytes are develops from hematopoietic stem cells [3]

5. In the humoral branch of the immune system, antigen induces the clonal proliferation of B lymphocytes into antibody- secreting plasma cells and memory B cells. As seen in the following figure but it is observed from the figure that second immunization with the same Antigen A results in a secondary response that is greater in magnitude but response against antigen B is weak; similarly rate of rejection is different with same strain in repeated graft. Explain in detail about the mechanism of graft rejection and secondary response using following figure. [4]