



**RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES**

**Bachelor of Science Honours in Microbiology
Third Year – Semester II Examination – Jan./ Feb. 2023**

MIB 3207 – IMMUNOLOGY

Time: Two (02) hours

Answer ALL questions.

SECTION I [40%]

MCQ [30 Min] [20 marks]

(Note: There maybe one or more correct responses)

- 1. Which of the following is/are true regarding complements?**
 - a. C3a is the most potent anaphylatoxin
 - b. C4b is an opsonin
 - c. C8 deficiency leads to pneumococcal infection
 - d. Salmonella infection activates the Lectin pathway
 - e. CH₅₀ is helpful to determine the function of the classical pathway

- 2. Which of the following is /are true regarding immune reactions?**
 - a. Leads to autoimmunity when dysregulated
 - b. IgE is associated with typr-1 hypersensitivity
 - c. NK cells are activated when a target cell does not express MHC class 2
 - d. Cytokines are essential for the activation of neutrophils
 - e. Macrophages are activated by interferon-alpha

- 3. Which of the following is/are true regarding antibodies?**
 - a. IgM is a hexamer
 - b. IgA crosses placenta
 - c. IgE is associated with hypersensitivity
 - d. The formation of antigen-antibody complexes leads to type-4 hypersensitivity
 - e. IgG is present in serum

4. Which of the following statement/s are true/false; (Write "true" or "false" for each response a to e)
 - a. Innate arm of immunity is responsible for a rapid response to a broad range of microbes
 - b. Adaptive immunity is antigen-specific
 - c. The spleen is a primary lymphoid organ
 - d. The liver produces complement proteins
 - e. Natural killer cells destroy cancer cells

5. Which of the following is/are true regarding cytokines?
 - a. Are term local hormones
 - b. One cytokine acts several cells
 - c. One cell can be affected by several cytokines
 - d. IL-5 involves in antibody class switching
 - e. Cytokine concentration can be measured by ELLISpot test

6. Cells involved in immunity and a function of each are given below. Mark the correct combination/ combinations:
 - a. Neutrophils kill bacteria
 - b. NK cells kill cells infected with viruses
 - c. Mast cells secrete histamine
 - d. Cytokines are important for neutrophil migration
 - e. Macrophages are activated by interferon gamma

7. Regarding innate immunity?
 - a. Is termed first line of defense for the pathogens
 - b. Is antibody mediated
 - c. Neutrophil function is important
 - d. T helper cells are essential
 - e. Antigen presentation is required

8. T cell receptors (TCR)?
 - a. The TCR is similar in size and structure to an antibody Fab fragment
 - b. Has α and β chain
 - c. Chains are bound by ionic bonds
 - d. CD4 is an integral component of TCR
 - e. The signaling components possess ITAM motifs

9. **Regarding adaptive immunity;**

- a. Is specific
- b. Antibody is an important component
- c. Cytotoxic T cells kill cells infected with intracellular pathogens
- d. Does not develop a memory
- e. Termed first line of defense

10. **Regarding B cells;**

- a. When activated, they are termed as plasma cells
- b. Produce antibodies
- c. To activate, T cells are always required
- d. Develops a memory
- e. Has IgM antibody on its surface

SECTION II [50%]

SEQ [1 HOUR] [Contribution to Final Mark - 30 marks]

1. a). List 3 immunological tests used to diagnose infectious diseases (15 marks)
- b). Describe the mechanisms of 2 mentioned tests in 1.a. (40 marks)
- c). Discuss how you would rationally use above mentioned tests to detect the aetiology of infectious diseases (45 marks)

2. a). What is "autoimmunity"? (20 marks)
- b). Describe the mechanisms of autoimmunity? (60 marks)
- c). List 5 predisposing factors responsible for autoimmune diseases? (20 marks)

1. Which of the following are true/false regarding hypersensitivity?
 - a. Type 1 leads to anaphylaxis
 - b. Type 2 is associated with immune complex formation
 - c. Immediate hypersensitivity is associated with IgM
 - d. Type 3 hypersensitivity is cytotoxic
 - e. Type 4 hypersensitivity leads to formation of multi-nucleated giant cells
2. Which of the following are true/false regarding transplantation;
 - a. HLA matching is mandatory
 - b. Blood group matching is not important
 - c. Can leads to development of infections following low virulent pathogens
 - d. Leads to a state of immunodeficiency
 - e. Is not done in Sri Lanka
3. Which of following is/are true regarding complements;
 - a. C6b leads to anaphylaxis
 - b. C3a is an opsonin
 - c. Membrane attack complex comprised C5 to C9 except C8
 - d. Following microbial infection, the Lectin pathway is always activated
 - e. AH₅₀ is helpful to determine the function of classical pathway
4. Which of following statement/s is/are true regarding immunoglobulins;
 - a. IgM is a dimer
 - b. IgG crosses placenta
 - c. IgE associated with autoimmunity
 - d. Formation of antigen-antibody complex leads to type-2 hypersensitivity
 - e. Respiratory mucosa is rich in IgA
5. Which of following statement/s is/are correct, regarding the interaction between cells of the immune system; -
 - a. B cells depend on dendritic cells for antigen presentation
 - b. T helper cells interact with B cells
 - c. CD4 receptors recognize HLA type I
 - d. CD8 receptors recognize HLA proteins on ordinary host cells
 - e. CD28 molecules are found on dendritic cells

6. Select the correct statement/s regarding cytokines.
- a. They attract immune cells to the site of infection
 - b. IL-2 is a growth factor of T cells
 - c. IL-10 inhibits B cells
 - d. INF- γ inhibits macrophages
 - e. IL-4 stimulates B cell activation
7. Select the correct statement/s regarding macrophages;
- a. reside in the blood as monocytes
 - b. are a class of lymphocytes
 - c. present antigens to T cells
 - d. are the most potent antigen presenting cells
 - e. bear Toll-like receptors on the surface
8. Select the correct statement/s regarding immunological diagnostics;
- a. ELISA is useful to detect antigens
 - b. Immunochromatography is useful to develop point-of-care tests
 - c. Agglutination tests used to detect antigens
 - d. Flowcytometry is useful to identify immune cells
 - e. Immunofluorescent assay is used to identify viruses
9. Select the correct statement/s regarding the functions of antibodies.
- a. Neutralize the antigens
 - b. Leads to opsonization
 - c. Leads to activation of complements
 - d. Agglutination
 - e. Autoimmunity
10. Select the correct answer/s from the following:
- f. Antigen presenting cell presents antigen to T helper cells
 - g. B7 and CD28 interaction is essential for T helper cell activation
 - h. Activated T helper cell interact with B cells
 - i. CD-40 and CD-40 ligand interaction is essential for B cell activation
 - j. IL-5 is essential to produce IgA by plasma cells

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