2025

(NEP—2020)

(5th Semester)

BIOCHEMISTRY (MAJOR3/MINOR)

(Immunology)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. Which cytokine is secreted by virus-infected cells in order to protect uninfected cells?

(a) Interferon ( )

(b) Interleukin ( )

(c) Tumor necrosis factor ( )

(d) Transforming growth factor ( )

2. The immune cells which defend the body against multicellular parasitic worms are

(a) eosinophils ( ) *(b)* neutrophils ( )

(c) mast cells ( ) *(d)* dendritic cells ( )

3. The immunoglobulin found in breast milk and saliva is

(a) IgG ( ) *(b)* IgM ( )

(c) IgD ( ) *(d)* IgA ( )

4. The presentation of foreign peptides is performed by

(a) MHC I ( ) *(b)* MHC II ( )

(c) MHC III ( ) *(d)* All of the above ( )

5. Which of the following statements about antibodies is not true?

(a) They activate the complement system. ( )

(b) They can neutralize the pathogens. ( )

(c) They are lipids in nature. ( )

(d) They are found on the surface of B-lymphocytes. ( )

6. Which of the following is CD8+ cell?

(a) Cytotoxic T-cell ( ) *(b)* Helper T-cell ( )

(c) Regulatory T-cell ( ) *(d)* Memory T-cell ( )

7. Antigens that are identical and exist on the cell surface of plants, animals and bacteria are known as

(a) autoantigens ( ) *(b)* alloantigens ( )

(c) cross-reactive antigen ( ) *(d)* heterophile antigens ( )

8. The strength of a bond between a particular paratope of antibody and a single antigenic determinant is

(a) intermolecular force ( ) *(b)* affinity ( )

(c) avidity ( ) *(d)* bonus effect ( )

9. Which immune cell is destroyed by HIV?

(a) C428+ ( ) *(b)* CD4+ ( )

(c) CD8+ ( ) *(d)* B7+ ( )

10. Which of the following is not a clinical stage of rejection?

(a) Secondary rejection ( ) *(b)* Acute rejection ( )

(c) Hyperacute rejection ( ) *(d)* Chronic rejection ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

Write short notes on *five* from the following, taking at least *one* from each Unit : 3×5=15

UNIT—I

1. Types of cytokines

2. Haematopoietic formation of immune cells

UNIT—II

3. Types of T-cells

4. Antibody-mediated cell toxicity

UNIT—III

5. Differences between exogenous and endogenous antigen

6. Structure of MHC class I antigen

UNIT—IV

7. Type I hypersensitivity

8. Chronic rejection

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer *five* questions, taking at least *one* from each Unit : 10×5=50

UNIT—I

1. What are the beneficial immune functions of the complement system? Explain the classical complement pathway in detail. 3+7=10

2. Write notes on the structures and functions of

(a) macrophages;

(b) neutrophils. 5+5=10

UNIT—II

3. Explain the structure and function of the different classes of immunoglobulins. 10

4. Give a detailed account of B-cell activation. 10

UNIT—III

5. What are the characteristics of antigen-antibody interaction? Explain the process of agglutination and complement fixation. 2+4+4=10

6. Define antigen-presenting cells. Give a detailed account of antigen processing and presentation by class II MHC pathway. 2+8=10

UNIT—IV

7. Write short notes on the following : 5+5=10

(a) Systemic lupus erythematosus

(b) Multiple sclerosis

8. What are the different types of vaccine? Explain the nature and advantages of live vaccines and subunit vaccines. 7+3=10

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