PG Even Semester Exam, May 2025

Biotechnology

4th Semester

COURSE NO. BTYCC – 653B

[Molecular Immunology and Inmmunotechnology]

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer five questions, taking one from each Unit

UNIT-I

1. a. Mention the different stages of B cell maturation. State the characteristics of B cells. 6+4=10

   b. Differentiate between T helper and T cytotoxic cells. 4

2. State the role of cytokines in immunoregulation citing appropriate examples of their source and functions. 14

Turn over

3. a. Briefly elucidate the signal transduction of affinity maturation. 8

   b. Write short notes on: 2x3=6

      i. Syk proteins

      ii. Allelic exclusion

      iii. Receptor editing

4. a. Write brief notes on: 3x2=6

      i. Immunologic memory

      ii. Autoimmunity

   b. What is hypersensitivity? Classify it on the basis of its mechanism. 2+6=8

UNIT-III

5. a. Describe the structure and replication of HIV. 2+5=7

   b. What is graft rejection? Describe two pathways of graft rejection. 2+5=7

6. a. Give a brief comment on the T cell immunotherapy approach. 7

   b. Write notes on cancer stem cells and tumor antigens. 3.5x2=7

UNIT-IV

7. Write short notes on the following: 5+5+4=14

   a. Nude mice as genetic models for immunological studies.

   b. Chimeric antibodies and their commercial applications

   c. Phage display as a technique for antibody engineering.

8. a. Differentiate between NOD and NOG mice used for immunological studies. 5

   b. What do you mean by humanized antibodies? How are they useful? 5

   c. Discuss some applications of stem cells in medicine. 4

UNIT-V

9. a. Describe the steps involved in vaccine development. 7

   b. What is a subunit vaccine? Describe the process of preparation of DNA and RNA vaccines. 7

10. Write notes on: 7x2=14

    a. Combined vaccines with examples

    b. Vaccine response.

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