



**B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023**

(Regulation 2018)

Sixth Semester

**BIOTECHNOLOGY**

U18BTI6203: Immunology

**COURSE OUTCOMES**

- CO1:** Comprehend the general concepts of immune system and elaborate the cells and organs of the immune system  
**CO2:** Analyze and evaluate the properties of antigens and antibodies with special emphasis on haptens.  
**CO3:** Demonstrate and evaluate various antigen-antibody interactions and techniques.  
**CO4:** Apply the concept of cell mediated immunity and complement system  
**CO5:** Illustrate the mechanisms behind hypersensitivity and autoimmunity mechanisms.  
**CO6:** Imbibe the concept of transplantation and cancer immunology

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

- |  |     |                   |
|--|-----|-------------------|
| 1. Specify the cells participating in innate and adaptive immunity.          | CO1 | [K <sub>2</sub> ] |
| 2. Mention the mechanism of ADCC mediated by NK cells.                       | CO1 | [K <sub>2</sub> ] |
| 3. Distinguish competitive and progressive signals in lymphocyte activation. | CO2 | [K <sub>2</sub> ] |
| 4. Abbreviate: CDR and FcRN.   | CO2 | [K <sub>1</sub> ] |
| 5. Classify primary and secondary serological test.                          | CO3 | [K <sub>2</sub> ] |
| 6. Illustrate indirect ELISA techniques.                                     | CO3 | [K <sub>3</sub> ] |
| 7. Specify macrophage's role in cell mediated immunity.                      | CO4 | [K <sub>3</sub> ] |
| 8. Differentiate chemokine and lymphokine.                                   | CO4 | [K <sub>2</sub> ] |
| 9. Mention 3 main outcomes of failure of immune system?                      | CO5 | [K <sub>2</sub> ] |
| 10. Abbreviate: TATA and TSTA.   | CO6 | [K <sub>1</sub> ] |

**Answer any FIVE Questions:-**

**PART B (5 x 16 = 80 Marks)**

**(Answer not more than 400 words)**

- |  |    |     |                   |
|--|----|-----|-------------------|
| 11. a) Both innate and adaptive immunity are cooperative and interdependent ways to protect the host – Justify your answer with specific examples. | 10 | CO1 | [K <sub>3</sub> ] |
| b) Give detailed note on lymphoid tissue to understand mucosal immunity.   | 6  | CO1 | [K <sub>2</sub> ] |

12.	a)	Narrate mechanism of B cell activation based on participation of T-dependent and independent antigen.	10	CO2	[K <sub>2</sub> ]
	b)	Compare salient features of all four subclass of IgG with specific biological properties.	6	CO2	[K <sub>3</sub> ]
13.	a)	Suggest and illustrate suitable technique to quantify amount of antigen present in serum by applying principles of precipitation.	10	CO3	[K <sub>2</sub> ]
	b)	Illustrate key steps involved in production of monoclonal antibody.	6	CO3	[K <sub>3</sub> ]
14.	a)	Correlate functions of CTLs, NK cells and their effector mechanism to understand cell mediated immunity.	10	CO4	[K <sub>4</sub> ]
	b)	Give an insight knowledge on activation of complement by classical, alternate and lectin pathway and its biological consequences.	6	CO4	[K <sub>2</sub> ]
15.	a)	Summarize immunological basis of graft rejection and acceptance to understand basics of transplantation immunology.	10	CO5	[K <sub>2</sub> ]
	b)	Recommend suitable techniques to get maximal donor-recipient compatibility for tissue/organ transplantation study.	6	CO5	[K <sub>5</sub> ]
16.	a)	Describe the induction of T lymphocyte response to any tumor cells- Explain with neat sketch.	10	CO6	[K <sub>2</sub> ]
	b)	Suggest immunotherapy approaches to treat breast cancers and specify challenges associated with each approach.	6	CO6	[K <sub>4</sub> ]

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