


Name:			
Enrolment No:			
<div>End Semester Examination, May 2025</div> <div><div>Course: Immunology & Immunotechniques</div><div>Program: B TECH BIOTECH</div><div>Course Code: HSB2007</div></div> <div><div>Semester : IV</div><div>Duration : 3 Hours</div><div>Max. Marks: 100</div></div>			
Instructions: Read all questions carefully.			
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks) All questions compulsory	Marks	COs
Q 1	Which cells are known as professional antigen-presenting cells (APCs)? a) B cells b) Macrophages c) Dendritic cells d) All of the above	1.5	CO1
Q 2	The ability of an antigen to bind specifically with an antibody is termed: a) Immunogenicity b) Avidity c) Antigenicity d) Specificity	1.5	CO2
Q 3	Which immunoglobulin can cross the placenta? a) IgA b) IgE c) IgG d) IgM	1.5	CO1
Q 4	Which region of an antibody binds to antigen? a) Fc region b) Variable region c) Constant region d) Hinge region	1.5	CO3
Q 5	T-cell receptors are structurally similar to: a) IgA b) MHC molecules c) Fab portion of antibodies d) Fc portion of antibodies	1.5	CO2
Q 6	MHC class I molecules present peptides to: a) Helper T cells	1.5	CO2

	b) B cells c) Cytotoxic T cells d) NK cells														
Q 7	Cytokines involved in inflammatory responses include: a) IL-2 and IL-4 b) IFN- γ and TNF- α c) IL-10 and IL-12 d) IL-8 and EPO	1.5	CO1												
Q 8	A graft between genetically identical individuals is called a: a) Allograft b) Isograft c) Xenograft d) Autograft	1.5	CO1												
Q 9	An example of an autoimmune disease is: a) Tuberculosis b) Diabetes mellitus type 1 c) Influenza d) Measles	1.5	CO1												
Q 10	In Western blotting, proteins are first separated by: a) Centrifugation b) Chromatography c) Electrophoresis d) ELISA	1.5	CO2												
Q 11	_____ is the portion of the antigen recognized by the antibody.	1.5	CO1												
Q 12	The cells responsible for producing antibodies are called _____.	1.5	CO3												
Q 13	Class II MHC molecules present antigens to _____ T cells.	1.5	CO1												
Q 14	Fluorescence Activated Cell Sorting is a technique under _____.	1.5	CO2												
Q 15	Match the following <table><tr><td>Column A</td><td>Column B</td></tr><tr><td>1. IgE</td><td>a. Mucosal immunity</td></tr><tr><td>2. MHC Class I</td><td>b. Allergic reactions</td></tr><tr><td>3. IgA</td><td>c. Presents to CD8⁺ T cells</td></tr><tr><td>4. ELISA</td><td>d. Enzyme-linked detection</td></tr><tr><td>5. TCR</td><td>e. Antigen recognition by T cells</td></tr></table>	Column A	Column B	1. IgE	a. Mucosal immunity	2. MHC Class I	b. Allergic reactions	3. IgA	c. Presents to CD8 ⁺ T cells	4. ELISA	d. Enzyme-linked detection	5. TCR	e. Antigen recognition by T cells	1.5	CO1
Column A	Column B														
1. IgE	a. Mucosal immunity														
2. MHC Class I	b. Allergic reactions														
3. IgA	c. Presents to CD8 ⁺ T cells														
4. ELISA	d. Enzyme-linked detection														
5. TCR	e. Antigen recognition by T cells														
Q 16	Which immunoassay involves a color change due to enzyme-substrate reaction? a) Western blot b) FACS c) ELISA d) Immunoprecipitation	1.5	CO1												
Q 17	Allograft rejection is mediated by B cells. (True/ False).	1.5	CO2												

Q 18	ELISA is a qualitative technique only. (True/False).	1.5	CO3
Q 19	Cytokines are proteins that regulate immune responses. (True/False).	1.5	CO1
Q 20	Fluorescence-activated cell sorting (FACS) is a type of: a) ELISA b) Immunoblot c) Flow cytometry d) Agglutination test	1.5	CO2
Section B (4Qx5M=20 Marks)			
Q 1	Compare and contrast innate and adaptive immunity.	5	CO2
Q 2	Describe the complement system and its role in immune defense.	5	CO2
Q 3	Explain the working principle of any two immunodiagnostic techniques.	2.5+2.5	CO3
Q 4	Discuss the applications of immunotherapeutics in disease treatment.	5	CO2
Section C (2Qx15M=30 Marks)			
Q 1	Case: A laboratory is developing a monoclonal antibody therapy targeting a tumor antigen. Question: Explain the steps involved in monoclonal antibody production and discuss the advantages of monoclonal over polyclonal antibodies in cancer therapy.	7.5 +7.5	CO1
Q 2	Case: A kidney transplant recipient begins showing signs of graft rejection two weeks post-surgery. Question: Discuss the types of graft rejection and the immune mechanisms involved in allograft rejection.	5+10	CO2
Section D (2Qx10M=20 Marks)			
Q 1	Differentiate between affinity and avidity of antigen-antibody interactions.	5+5	CO2
Q 2	Describe the principle and applications of ELISA and Western blotting.	5+5	CO3