


Name:			
Enrolment No:			
UPES End Semester Examination, December 2023			
Course: Immunology		Semester : 3rd	
Program: B.Sc. Microbiology		Duration : 3 Hours	
Course Code: HSMB 2022		Max. Marks: 100	
Instructions: Attempt all the questions			
S. No.	Section A	Marks	COs
	Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)		
Q 1	What is immunological dysregulation, and how does it contribute to autoimmune diseases?	1.5	CO2
Q 2	Provide an example of an autoimmune disease and the corresponding self-antigen involved.	1.5	CO3
Q 3	Define hypersensitivity reactions and give an example of a Type I hypersensitivity reaction.	1.5	CO3
Q 4	What is the mechanism behind Type II hypersensitivity reactions, and provide an example.	1.5	CO4
Q 5	What is the role of cytotoxic T cells in Type IV hypersensitivity reactions.	1.5	CO5
Q 6	Define immunodeficiencies and provide an example of a severe combined immunodeficiency (SCID).	1.5	CO5
Q 7	Leukocyte adhesion deficiency (LAD) affects which cellular process, and what are the consequences for the immune system?	1.5	CO1
Q 8	Differentiate between benign and malignant tumors.	1.5	CO2
Q 9	What are tumor antigens, and how do they differ from normal antigens?	1.5	CO2

Q 10	Name two major types of cancer therapy targeting the immune system.	1.5	CO3
Q 11	What is the role of checkpoint inhibitors in cancer immunotherapy?	1.5	CO4
Q 12	How is the zone of equivalence related to the optimal conditions for immunodiffusion?	1.5	CO4
Q 13	In immunoelectrophoresis, what role does electrophoresis play in the separation of proteins?	1.5	CO5
Q 14	How does immunoelectrophoresis combine the principles of electrophoresis and immunodiffusion?	1.5	CO5
Q 15	How can viruses contribute to the development of cancer?	1.5	CO4
Q 16	Name a common environmental factor associated with an increased risk of cancer.	1.5	CO5
Q 17	Define monoclonal antibodies and provide an example of their use in cancer therapy.	1.5	CO5
Q 18	Name two major types of cancer therapy targeting the immune system.	1.5	CO4
Q 19	What are tumor antigens, and how do they differ from normal antigens?	1.5	CO3
Q 20	Differentiate between benign and malignant tumors.	1.5	CO3
Section B (4Qx5M=20 Marks)			
Q 1	Investigate the role of MHC diversity in transplantation and immune responses. How does the recognition of foreign MHC molecules by T cells influence graft acceptance or rejection?	5	CO3
Q 2	Explore the concept of cross-presentation in antigen processing. How does cross-presentation by dendritic cells contribute to the activation of CD8+ T cells?	5	CO4

Q 3	Differentiate between the classical, alternative, and lectin pathways of complement activation. How does each pathway initiate the cascade and contribute to pathogen elimination?	5	CO4
Q 4	Explore the evolving role of flow cytometry in single-cell analysis and its applications in immunology and cancer research. How does flow cytometry contribute to the advancement of precision medicine?	5	CO5
Section C (2Qx15M=30 Marks)			
Q 1	Discuss the challenges associated with interpreting Western blotting results, particularly in terms of background noise and nonspecific binding. How can these challenges be mitigated to ensure accurate data interpretation?	15	CO5
Q 2	Compare the advantages and limitations of immunodiffusion and ELISA in terms of sensitivity and specificity. In what scenarios would one technique be preferred over the other?	15	CO4
Section D (2Qx10M=20 Marks)			
Q 1	Discuss the principles of flow cytometry, emphasizing its role in cell analysis and sorting. How do fluorescently labeled antibodies contribute to the multiparametric analysis of individual cells?	10	CO4
Q 2	Describe the process of Western blotting, emphasizing the significance of gel electrophoresis and antibody detection. How does Western blotting contribute to the identification of specific proteins?	10	CO5