


Name:			
Enrolment No:			
UPES			
End Semester Examination, December 2024			
Course: Immunology and ImmunoTechnology		Duration: 3 Hours Max. Marks: 100	
Semester: 5 th			
Program: B. Tech Biotechnology			
Course Code: HSMB3026			
Instructions: Attempt all questions			
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	What immune cell type is the main effector in cell-mediated immunity?	1.5	CO1
Q 2	Which immune cell type is primarily responsible for killing virus-infected cells?	1.5	CO2
Q 3	What is the primary function of Natural Killer (NK) cells?	1.5	CO3
Q 4	What is the term for substances that can trigger an immune response by being recognized as foreign?	1.5	CO2
Q 5	What type of lymphoid organs are lymph nodes and the spleen?	1.5	CO2
Q 6	Name a pro-inflammatory cytokine involved in activating immune responses.	1.5	CO3
Q 7	What part of the immune system provides the first line of defense against pathogens?	1.5	CO3
Q 8	What is the process by which B cells switch from producing one class of antibody to another?	1.5	CO4
Q 9	Where does somatic hypermutation primarily occur in the immune system?	1.5	CO4
Q 10	What is clonal selection in the context of the immune system?	1.5	CO2
Q 11	Which type of T cell is known for helping to regulate and suppress immune responses?	1.5	CO3
Q 12	What immune response occurs when antibodies from an external source, such as maternal antibodies, protect an individual?	1.5	CO4

Q 13	Name a condition in which the immune system attacks its own tissues.	1.5	CO4
Q 14	What is a hypersensitivity reaction?	1.5	CO2
Q 15	What type of immune checkpoint inhibitor is used to block T cell inhibition in cancer therapy?	1.5	CO3
Q 16	Which type of antibody production involves immunizing an animal to produce a mixture of antibodies?	1.5	CO2
Q 17	What is the main goal of cancer immunotherapy?	1.5	CO1
Q 18	Which immunological technique involves detecting proteins separated by gel electrophoresis?	1.5	CO1
Q 19	What is the purpose of using flow cytometry in immunology?	1.5	CO1
Q 20	Name one immune checkpoint protein that can inhibit T cell activation.	1.5	CO1
Section B (4Qx5M=20 Marks)			
Q 1	Discuss the significance of memory B and T cells in vaccination. (2.5 marks) How do they contribute to long-term immunity? (2.5 marks)	5	CO3
Q 2	What are immune checkpoints, and how do checkpoint inhibitors work in cancer immunotherapy?	5	CO2
Q 3	Describe the differences between polyclonal and monoclonal antibodies, including one application for each.	5	CO3
Q 4	Explain the concept of passive immunization and provide one example of its application.	5	CO4
Section C (2Qx15M=30 Marks)			
Q 1	What is flow cytometry, and how is it used in immune cell analysis?	15	CO4
Q2	What is immunohistochemistry, and why is it useful in studying immune responses?	15	CO2
Section D (2Qx10M=20 Marks)			
Q 1	Describe the mechanism of action for CTLA-4 and PD-1 checkpoint inhibitors in cancer immunotherapy.	10	CO3
Q2	Explain how autoimmunity occurs and give an example of an autoimmune disease.	10	CO4