

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- MAY-2025

M.Sc –II Semester (BT)

Course Code (Credits): 20MS1BT212 (3)

Max. Marks: 35

Course Name: Immunology

Course Instructors: Dr.Abhishek

Max. Time: 2.0 Hour

*Note: All questions are compulsory. Marks are indicated against each question in square brackets.*

Q.N	Question	Marks
Q1	<p>Immunologists worked for decades to come up with a genetic explanation for the enormous variety of antibody structures. Germ-line theories and somatic-variation theories are the two distinct groups of hypotheses that have surfaced.</p> <ol style="list-style-type: none"> <li>Describe both the theories in detail and include a list of their shortcomings.</li> <li>Outline the Tonegawa and Hozumi gene rearrangement model using an appropriate example and its importance in overcoming the drawbacks of the germ-line and somatic-variation theories.</li> </ol>	3+3
Q2	<p>Answer the following question</p> <ol style="list-style-type: none"> <li>Explain why NK cells from a given host will kill many types of virus-infected cells but do not kill normal cells from that host</li> <li>VH segment cannot join directly with a JH segment in heavy-chain gene rearrangement, Why?</li> <li>Considering only combinatorial joining of gene segments and association of light and heavy chains, how many different antibody molecules potentially could be generated from germ-line DNA containing 500 VL and 4 JL gene segments and 300 VH, 15 DH, and 4 JH gene segments?</li> </ol>	2+2+3
Q3	<p>Provide a suitable response to the following query.</p> <ol style="list-style-type: none"> <li>Hemolytic disease of the newborn is caused by type II hypersensitive reactions which can be minor, serious, or lethal, Detail out about the role of type-II hypersensitive reaction in the death of new born.</li> <li>Drug-induced hemolytic anemia is a very rare but potentially lethal adverse drug reaction, which can take the form of oxidative damage to vulnerable erythrocytes. What do you think, what type of hypersensitivity is hemolytic anemia? Describe in depth.</li> <li>What is the role of the complement system in hypersensitivity? and which types of hypersensitivity reactions are involved in the complement activation?</li> <li>Justify the role of reaginic antibody in hypersensitive reaction?</li> </ol>	3+3+2+2



Q4	<p>Respond to the following question by applying the idea of a vaccine:</p> <ol style="list-style-type: none"> <li>Explain the phenomenon of herd immunity. How does this phenomenon relate to the appearance of certain epidemics?</li> <li>Passive immunization is sometimes more important than active immunization, explain?</li> <li>What are the advantages of the Sabin polio vaccine compared with the Salk vaccine? Why the Sabin vaccine is no longer recommended for use in the United States?</li> <li>Why Active immunity is consider more advantageous than passive immunity?</li> <li>What are the advantages and disadvantages of using attenuated organisms as vaccines?</li> </ol>	2+2+3+2+1
Q5	How might an insect, such as a ant or grasshopper, protect itself from infection? In what ways might the innate immune responses of an insect be similar to those of a Wheat plant and how might they differ?	2