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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May 2024 Semester End Make-Up Examinations

Programme: B.E. **Semester: V**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 19BT5DE1IMM **Max Marks: 100**
Course: Immunotechnology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	What is innate immunity? What does it comprise of?	**05**
	b)	Elaborate the functions of primary and secondary lymphoid organs. Mention the different organs involved in each.	**05**
	c)	To which immunological response are the cardinal signs of rubor, calor and dolor associated with? Elucidate the various stages involved.	**05**
	d)	What is clonal selection theory?	**05**

UNIT - II

2	a)	Illustrate the typical structure of antibody. Compare antigenicity and immunogenicity.	**08**
	b)	Elaborate on the structure and functions of Class II MHC antigens.	**07**
	c)	Antigen presentation is the prime feature for development of immune response. Discuss the functions of various antigen presenting cells (APCs).	**05**

OR

3	a)	Elaborate the different stages involved in CTL mediated killing of target cells.	**08**
	b)	Highlight the differences in peptide binding by Class I and Class II MHC molecules.	**06**
	c)	What is antibody affinity and avidity? What are the characteristic features of B-cell and T-cell epitopes?	**06**

UNIT - III

4	a)	What are the components of complement system? Draw a comparison between classical and alternate pathways of complement activation.	**07**
	b)	Give a diagrammatic representation of Type IV hypersensitivity reaction. What are the three points describing the onset and typical characteristics of this reaction.	**08**
	c)	Define autoimmunity. Demonstrate the underlying mechanism with reference to Rheumatoid Arthritis.	**05**

OR

5	a)	What are the different types of hypersensitivity reactions? Give examples of each type.	**07**
	b)	Elaborate on the mechanism of transplant rejection. How can transplant rejection be prevented?	**08**
	c)	What is cross-reactivity? What is its relevance in immune reactivity?	**05**

UNIT - IV

6	a)	Elucidate the different types of vaccines with examples.	**06**
	b)	How are hybridomas generated for the production of monoclonal antibodies? Represent this schematically.	**08**
	c)	What type of immunity is induced by using vaccine? Discuss the mechanism, advantages and disadvantages of recombinant vaccines.	**06**

UNIT - V

7	a)	If you are given antibody coated onto microtiter plate, which type of ELISA would you employ? Elaborate on the method.	**08**
	b)	What are the special features of antigen-antibody interaction? Present it with the illustration of RIA technique.	**05**
	c)	Depict the technique of Western Blot with a labelled diagram.What are its applications?	**07**

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May 2024 Semester End Make-Up Examinations

Programme: B.E. **Semester: V**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 22BT5PCIMM **Max Marks: 100**
Course: Immunotechnology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Consider the following two case studies and answer the questions below. Case study 1: A person's skin surface and naso-pharyngeal regions were exposed to pathogenic *S.aureus*. It is seen that the pathogen could not move further from these regions. Also the person did not develop any symptoms of the disease. Scenario 2: A person's oral route and deep cut in the skin comes in contact with the pathogenic *S.aureus*. After 7 days he develops severe symptoms of the disease. Only when the person treated with the serum from other person, he could recover from the disease. i. Name the types of immunity associated with the above two scenarios and distinguish them accordingly. ii. Infer the major problems associated with the person in scenario 2 with respect to immunity.	*CO1*	*PO1*	**08**
	b)	Differentiate primary lymphoid organs from secondary lymphoid organs. With a neat diagrammatic representation explain the salient features and functional aspects of lymph node.	*CO1*	*PO1*	**08**
	c)	Discuss the importance of PMN cells in immunity with suitable examples.	*CO1*	*PO1*	**04**
		UNIT - II			
2	a)	Mention the classes of Immunoglobulins. Describe with a neat diagrammatic representation the salient features and functions of Ig molecule that exist as pentamer.	*CO2*	*PO1*	**10**
	b)	Define MHC. Discuss the salient features, structure and functional aspects of the one that presents processed antigens to CD-8 T cells.	*CO1, 2*	*PO1*	**10**
		OR			
3	a)	What are Naive B cells? Describe their formation and further activation and maturation into functional B cells.	*CO2*	*PO1*	**10**

		b)	Distinguish the two types of pathways meant for processing and presenting the antigens. Describe the process which is preferably mediated by the class II MHC molecule. Briefly comment on the cross-presentation.	*CO1, 2*	*PO1*	**10**
			UNIT - III			
	4	a)	Differentiate Classical pathway of complement system from Alternative pathway. Discuss the pathway leading to the formation of membrane attack complex in alternative pathway.	*CO3*	*PO1, 6*	**10**
		b)	Classify the major types of hypersensitive reactions. With a neat diagrammatic representation, explain the one mediated by immune complex.	*CO3*	*PO1, 6*	**10**
			OR			
	5	a)	Discuss the major autoimmune diseases that occur as a result of direct cellular damage.	*CO3*	*PO1, 6*	**10**
		b)	Describe the mechanism of graft acceptance and rejection with suitable diagrammatic illustration. Add a note on role of HLA antigens in it.	*CO3*	*PO1, 6*	**10**
			UNIT - IV			
	6	a)	Briefly explain the design and applications of immunotoxins, hetero-conjugated antibodies and chimeric antibodies.	*CO4*	*PO6, 13*	**08**
		b)	Distinguish Attenuated vaccines from Inactivated vaccines with suitable examples. Comment on their merits and demerits.	*CO4*	*PO6, 13*	**08**
		c)	Give the diagrammatic representation of Hybridoma technology.	*CO4*	*PO6, 13*	**04**
			UNIT - V			
	7	a)	Write the principle, procedure and applications of ELISA technique wherein the antigen is held between two antibodies.	*CO5*	*PO4*	**10**
		b)	Discuss the principle, procedure and applications of western blot technique.	*CO5*	*PO4*	**10**

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