Q. Code:176978

Reg. No. | | | | | | | | | | | | | |

M.E / M.TECH. DEGREE EXAMINATIONS, MAY 2024

Second Semester

BY22203 – IMMUNOTECHNOLOGY

(Biotechnology)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Explains immune responses and techniques to assess immune responses.	**2**
CO 2	Experiment with antibodies to assess immune responses.	**3**
CO 3	Organizes assess immune response assessment using assays.	**3**
CO 4	Distinguishes the various cases of vaccine based on its principle.	**4**
CO 5	Appraise development of engineered antibodies.	**5**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Distinguish the structure and function of primary and secondary lymphoid organs.	**1**	**2**
2.	How do antibodies neutralize pathogens?	**1**	**2**
3.	How does the complement system amplify the humoral immune response?	**1**	**2**
4.	Mention the difference between active and passive immunity.	**1**	**2**
5.	Compare direct and indirect ELISA format.	**2**	**3**
6.	List the applications of ELISA and agglutination tests for antibody detection.	**2**	**3**
7.	How does the Plaque Forming Cell Assay measure the presence and quantity of antibody-producing cells?	**2**	**3**
8.	What information can be obtained by combining Immunoelectrophoresis with Western Blotting?	**2**	**3**
9.	Which aspect of lymphocyte function used in Lymphoproliferation assay?	**3**	**3**
10.	What property of PBMCs allows their separation from whole blood using density gradient centrifugation?	**3**	**3**
11.	What are CD markers and how does flow cytometry use them to differentiate lymphocytes?	**3**	**3**
12.	Why is HLA typing important in transplantation medicine?	**3**	**3**
13.	How can immunofluorescence be used to assess vaccine efficacy?	**4**	**3**
14.	Differentiate between immunofluorescence and immunoenzymatic techniques.	**4**	**3**
15.	Distinguish the protein-based vaccines and DNA vaccines with example.	**4**	**3**
16.	How do variations in antigen size and morphology influence their detection sensitivity using immunoferritin labeling?	**4**	**3**
17.	Classify engineered antibodies different from naturally occurring antibodies?	**5**	**4**
18.	Analyse how genetically engineered antibodies be applied to precisely target and combat specific diseases?	**5**	**4**
19.	Appraise the specific advantages offered by catalytic antibodies in comparison to traditional enzymes.	**5**	**4**

20.	Infer the constraints associated with employing combinatorial libraries for antibody isolation.	**5**	**4**

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL
21.(a)	Compare and contrast the immunogenicity of different types of antigens preparation strategies for raising antibodies.	**(10)**	**1**	**2**
	(OR)			
(b)	Explain the mechanisms by which adjuvants can enhance the immune response with advantages and disadvantages.	**(10)**	**1**	**2**
22.(a)	Compare and contrast the applications of western blot analysis and SDS-PAGE in protein research.	**(10)**	**2**	**3**
	(OR)			
(b)	Explain how ELISA can be used to quantify the concentration of a specific antigen in a sample.	**(10)**	**2**	**3**
23.(a)	Compare and contrast the advantages and limitations of different cytokine bioassay methods.	**(10)**	**3**	**3**
	(OR)			
(b)	Explain the principle of the Cr51 release assay and how it is used to measure cytolytic activity of immune effector cells. How does this assay differentiate between cytolytic and cytostatic effects?	**(10)**	**3**	**3**
24.(a)	Evaluate the methodology involved in reverse vaccinology and explain recombinant antigens with suitable examples.	**(10)**	**4**	**4**
	(OR)			
(b)	Discriminate the protein-based vaccines and DNA-based vaccines. Discuss the strengths and weaknesses of each approach.	**(10)**	**4**	**4**
25.(a)	Criticize the statement idiotypic antibodies play a role in immune regulation.	**(10)**	**5**	**4**
	(OR)			
(b)	Devise a combinatorial library-based methodology for the isolation of high-affinity antibodies against a wide range of targets.	**(10)**	**5**	**4**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	"Assess the strategy for designing and implementing genetically engineered antibodies to improve the efficacy and specificity of immunotherapy treatments."	**(10)**	**5**	**5**

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