

Reg.No.:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 90015

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024

Fifth Semester

Biotechnology

U19BT515 – IMMUNOLOGY AND IMMUNOTECHNOLOGY

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels	K1 – Remembering	K3 – Applying	K5 - Evaluating
(KL)	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What are the properties of the immunogen that contribute to immunogenicity? List out any two properties that contribute to immunogenicity.	2	K1	CO1
2.	Explain briefly the difference between naive lymphocytes and effector lymphocytes.	2	K2	CO1
3.	How does an immature B-lymphocyte become a mature lymphocyte?	2	K2	CO2
4.	Immature B-cells bearing potentially autoimmune receptors can be managed in different ways to minimize the probability of disease. State any two strategies, noting whether they are shared by T-cell progenitors.	2	K2	CO2
5.	Classify subsets of helper T cells, and do they differ?	2	K2	CO3
6.	State the structural organization of class I MHC molecule with suitable illustration.	2	K1	CO3
7.	Explain the pathogenesis of Myasthenia Gravis.	2	K4	CO4
8.	List any two methods of immunotherapy used in cancer patients.	2	K4	CO4
9.	Outline the principle and procedure for Western blot analysis.	2	K3	CO5

10. Differentiate active immunization and passive immunization with suitable examples. 2 K3 CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	What are primary lymphoid organs and secondary lymphoid organs? Where are they located? Discuss in detail about the structural organization and functioning of any two secondary lymphoid organs with suitable diagrams.	13	K1	CO1
	(OR)			
b)	What is innate immunity and adaptive immunity? Discuss how our body fights against a bacterial infection by collaborating the innate and adaptive immunity in a cooperative manner?	13	K1	CO1
12. a)	Define immunoglobulin. Explain the structure and properties of different immunoglobulins.	13	K2	CO2
	(OR)			
b)	What is a complement system? What are the different pathways of complement activation, explain any one of the pathway in detail.	13	K2	CO2
13. a)	Describe in detail how exogenous and endogenous antigens are processed and presented on MHC molecules.	13	K2	CO3
	(OR)			
b)	Describe the positive and negative selection of thymocytes in the thymus with suitable illustrations.	13	K2	CO3
14. a)	With the help of suitable schematic discuss about the pathologic immune mechanisms of Type I, II, III and IV hypersensitivity reactions. Add a note on the mechanisms of tissue injury and diseases caused by these hypersensitivity reactions.	13	K4	CO4
	(OR)			
b)	Examine the immunological basis of graft rejection. Briefly discuss how graft rejection can be prevented.	13	K4	CO4
15. a) i.	What is ELISA? Discuss about the different variants of ELISA and the principle and procedure in those ELISA.	10	K3	CO5
		3	K3	CO5
ii.	Discuss about any one immunodiffusion assay that can be used to determine the relative concentrations of antigens or antibodies.			

(OR)

- b) Explain the production of monoclonal antibodies using hybridoma technology. Discuss about the applications of monoclonal antibodies in diagnosis and therapy. 13 K4 CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	i. Explain the differences between primary and secondary immune responses. Explain why secondary immune responses are superior to primary immune responses in terms of speed, strength, and quality.	6	K2	CO2
	ii. Describe the cellular mechanisms by which the currently used vaccines against polio and COVID-19 induce protective immune response in humans.	9	K3	CO5
	(OR)			
b)	i. While on a backpacking trip, a young man was bitten by a poisonous snake. The young man was airlifted to the nearest hospital, where he received human immunoglobulin treatment (gammaglobulin or antiserum) against the poisonous snake venom. The man recovered from the snakebite and returned home safely. One year later during an environmental study field trip, the young man was bitten once again by the same type of snake. Please answer the following questions: p. Since that person fully recovered from the first snakebite, is he been protected from the effects of the poison this second time (i.e., did he develop adaptive immunity)? Give explanation. q. Immunologically, what occurred the first time that person was bitten and treated for the snake bite? How did he recover? r. Compared to the first snakebite, is that person more sensitive, less sensitive, or equally sensitive to the venom from the second bite? Give explanation.	6	K2	CO2
	ii. What are agglutination reactions? Discuss about any two diagnostic methods based on agglutination reactions.	9	K3	CO5