QP Code: R262B001 | Reg. No | | | | | | | | | | | AY 25

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

M.Tech. (Second Semester - Regular) Examinations, May – 2026

24MBTPC12001– Advanced Immunology and Genetic Engineering

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Mention the role of macrophages in innate immunity.	CO1	K2
b. Give two examples of autoimmune diseases.	CO2	K1
c. Differentiate between linkers and adaptors.	CO3	K3
d. Mention the role of primers in PCR.	CO4	K2
e. Write the application of Phage display.	CO5	K3

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Define lymphoid organs and classify them into primary and secondary lymphoid organs.	5	CO1	K1
b. Describe the structure and functions of antibody molecules.	5	CO1	K2
(OR)			
c. Explain the structure and functions of MHC molecules in antigen presentation.	5	CO1	K2
d. Evaluate the role of antibodies in protection against infectious diseases.	5	CO1	K5
3.a. Differentiate between antibody-mediated and cell-mediated hypersensitivity reactions.	5	CO2	K3
b. Discuss the causes and immunological mechanisms of autoimmune diseases.	5	CO2	K2
(OR)			
c. Analyze the immunological basis of graft rejection in organ transplantation.	5	CO2	K3
d. Evaluate the importance of vaccination in prevention of infectious diseases.	5	CO2	K5
4.a. Describe the functions of DNA ligase, polynucleotide kinase and alkaline phosphatase in recombinant DNA technology	5	CO3	K2
b. Explain the role and applications of restriction enzymes in genetic engineering.	5	CO3	K2
(OR)			
c. Write the principle and applications of Western blotting technique.	5	CO3	K3
d. Highlight the different radioactive methods of DNA labelling.	5	CO3	K2
5.a. Describe the features and method of cloning using lambda phage vectors.	5	CO4	K2
b. Explain the structure and applications of Baculovirus vector system.	5	CO4	K2
(OR)			
c. Apply methodologies used to reduce formation of inclusion bodies.	5	CO4	K4
d. Write the principle and steps of Polymerase Chain Reaction (PCR).	5	CO5	K3
6.a. Explain the techniques of chemical method of DNA sequencing with diagram.	5	CO5	K2
b. Give the methodology and applications of gene knockout technology.	5	CO6	K1
(OR)			
c. Construct the cDNA libraries and write its applications.	5	CO6	K6
d. Discuss the principles and applications of gene therapy.	5	CO6	K2

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