MSc DEGREE EXAMINATION MAY 2026

(Second Semester)

Branch – **APPLIED MICROBIOLOGY**

IMMUNOTECHNOLOGY AND FORENSIC MICROBIOLOGY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Antigen presentation to T-lymphocytes occurs through: (i) Immunoglobulins (ii) Complement (iii) MHC molecules (iv) Interferons	K1	CO1
	2	Which cells are involved in NK-DC interaction in innate immunity? (i) Neutrophils (ii) Natural Killer cells (iii) Plasma cells (iv) Mast cells	K2	CO1
2	3	Which molecule is a cellular adhesion molecule? (i) TCR (ii) ICAM (iii) IgG (iv) Perforin	K1	CO2
	4	Toll-like receptors (TLRs) belong to which group of receptors? (i) Cytokine receptors (ii) Pattern Recognition Receptors (iii) Antibody receptors (iv) Complement receptors	K2	CO2
3	5	GVHD stands for (i) Graft versus Host Disease (ii) Host versus Graft Disease (iii) Graft versus Human Disorder (iv) Genetic Viral Host Disease	K1	CO3
	6	Which method is classified under biological immunosuppression? (i) Radiation therapy (ii) Corticosteroids (iii) Monoclonal antibodies (iv) UV exposure	K2	CO3
4	7	Which cytokine is mainly involved in macrophage activation? (i) IL-4 (ii) IFN-γ (iii) IL-10 (iv) TGF-β	K1	CO4
	8	Single Radial Immunodiffusion (SRID) is used to: (i) Detect cell-mediated immunity (ii) Measure antigen concentration (iii) Identify T cell subsets (iv) Detect complement proteins	K2	CO4
5	9	Microbial forensics primarily helps in (i) Developing vaccines (ii) Crime investigation involving biological agents (iii) Antibiotic production (iv) Food preservation	K1	CO5
	10	Agroterrorism involves (i) Use of plants as weapons (ii) Use of microorganisms to target crops or livestock (iii) Soil enrichment (iv) Vaccine production	K2	CO5

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SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	What is cell-mediated immunity? List the cells involved in it.	K1	CO1
		(OR)		
	11.b.	Differentiate between monoclonal and polyclonal antibodies and explain their applications.		
2	12.a.	Illustrate the structure of CD4 and CD8 molecules with suitable diagrams.	K2	CO2
		(OR)		
	12.b.	Outline the classification and functions of Pattern Recognition Receptors (PRRs).		
3	13.a.	Categorize primary and secondary immune deficiencies with suitable examples.	K3	CO3
		(OR)		
	13.b.	Utilize knowledge of tumor antigens in immune diagnosis of cancer.		
4	14.a.	Examine the characteristics of a good vaccine.	K4	CO4
		(OR)		
	14.b.	Dissect the role of TNF and IFN-γ in immune regulation.		
5	15.a.	Assess the role of microbial forensics in investigating biological warfare and agroterrorism events.	K5	CO5
		(OR)		
	15.b.	Deduce the significance of thanatomicrobiome in estimating post-mortem interval in forensic cases.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Enumerate the theories of antibody production and explain any two in detail.	K1	CO1
2	17	Describe hybridoma technology and its applications in monoclonal antibody production.	K2	CO2
3	18	Organize a comparative table showing differences between immunopotentiation and immunosuppression.	K3	CO3
4	19	Sequence the steps involved in immunoelectrophoresis (Rocket and counter current).	K4	CO4
5	20	Appraise the ecology of forensically relevant bacteria and its role in criminal investigations.	K5	CO5

Z-Z-Z END