

## M.Sc. Sem.-3 Examination

504 (EA)

## Bio-medical Technology

November-2025

Time : 2-30 Hours]

[Max. Marks : 70

Q-I	1	Discuss the different types of receptors and their characteristics.	(14)
	2	Explain autophosphorylation, its mechanism and significance in signaling.	
	OR		
	1	Describe briefly the stages of cell signaling with an example.	
	2	Write a short note on the cAMP pathway and its role in cellular signaling.	
Q-II	1	Discuss the types of nanoparticles and their applications.	(14)
	2	What is the importance of liposomes in the first FDA-approved nanodrug?	
	OR		
	1	Briefly describe the principle, mechanism and applications of DLS.	
	2	Describe the factors influencing zeta potential along with its advantages.	
Q-III	1	Write a note: iPSCs and their applications as regenerative medicine in different diseases.	(14)
	2	Write down the principles, applications, advantages, and disadvantages of magnetic-activated cell sorting and fluorescence-activated cell sorting techniques.	
	OR		
	1	What is BMSC? Write down different sources and their applications as regenerative medicine for blood and heart diseases.	
	2	What are the techniques used for stem cell isolation? Write down SELEX and microfluidics stem cell isolation techniques in detail.	
Q-IV	1	Explain the various criteria that determine the effectiveness of gene therapy.	(14)
	2	Give an account of the advantages and limitations of using DNA as a vaccine.	
	OR		
	1	Write an account on non-viral DNA delivery systems used in gene therapy.	
	2	Discuss the PCR variants and the specialized purposes for which they are employed.	
Q-V	<b>Answer any SEVEN out of TWELVE.</b>		(14)
	1	Define an antagonist and its primary role in receptor activity.	02
	2	Give the full form of "Hsp90" and mention its role.	02
	3	What are eicosanoids and their primary function?	02
	4	List the key features of the MinION.	02
	5	What are the classes of nanopores?	02
	6	What was Richard Feynman's contribution?	02
	7	Write down any two applications of adipose-derived stem cells.	02
	8	Write down the advantages and limitations of density gradient cell separation.	02
	9	Define: Neural stem cells.	02
	10	List four general strategies used in gene therapy.	02
	11	Write the full forms of SMART and ZMW in the context of PacBio sequencing.	02
12	Mention the four major platforms used in second-generation (NGS) sequencing technology.	02	

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Candidate's Seat No : \_\_\_\_\_

M.Sc. Sem.-3 Examination

504 (EE)

Bio-medical Technology

November-2025

Time : 2-30 Hours]

[Max. Marks : 70

Q-I	1	Describe the single cell gel electrophoresis assay and its significance in genotoxicity testing. Also, write its advantages and disadvantages.	(14)
	2	Explain the principle, method, applications, advantages and limitations of the LPO assay.	
	OR		
	1	Describe: Principle, procedure, uses, advantages and disadvantages of the SRB assay.	
	2	Write about the sister chromatid exchange assay as a tool for genotoxicity testing.	
Q-II	1	Write a detailed note on ecotoxicogenomics along with the conceptual framework.	(14)
	2	Enlist and explain the diseases caused by exposure to contaminated food.	
	OR		
	1	Explain in detail about the principles of Toxicology.	
	2	Enlist and explain the diseases caused by exposure to contaminated soil.	
Q-III	1	What are cyanotoxins, and briefly explain their different types, environmental risk factors, health risks of exposure, and monitoring and detection methods.	(14)
	2	Write a note: Outdoor air pollutants	
	OR		
	1	What is soil pollution? Write down the types of soil pollutants, sources, environmental impact, tests, prevention, and treatment of them.	
	2	What is heavy metal toxicity? Explain arsenic, lead and mercury toxicity in detail.	
Q-IV	1	Give a note on "ICH Guidelines".	(14)
	2	Explain briefly: importance of guidelines and standards in toxicology.	
	OR		
	1	Give a note on one occupational disease with its cause and prevention.	
	2	Describe the preparation and purpose of a regulatory dossier.	
Q-V	Answer any SEVEN out of TWELVE.		(14)
	1	Write the differences between programmed cell death and uncontrolled cell death.	02
	2	Give the complete names of the abbreviations HPRT and TFT.	02
	3	Give the equation used to determine cytotoxicity (%) using LDH release.	02
	4	The book 'Silent Spring' was written by _____. The author is also known as the _____ of Environmental toxicology.	02
	5	Write the full form of (i) AhR and (ii) PAH	02
	6	What is the common name of the disease Coccidioidomycosis? What is the route of exposure of Coccidioidomycosis?	02
	7	Define: Bioaccumulation	02
	8	What are the methods used for the measurement of trace metals?	02
	9	What is photochemical smog?	02
	10	Define a "teratogen" and give its effect.	02
	11	What is the role of VICH GL23 (R) guideline in veterinary drug safety?	02
12	Give the full form of 'GAP' and describe its role in farming operations.	02	