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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E.

Branch: Biotechnology

Course Code: 22BT5PCGEN

Course: Genetic Engineering

Semester: V

Duration: 3 hrs.

Max Marks: 100

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I		CO	PO	Marks
Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.	1	a)	Classify various types of RE. Provide examples for each and site of action with illustrations.		CO1	PO1	10
		b)	Identify three types of DNA modifying enzymes and write their mode of action.		CO1	PO1	10
	OR						
	2	a)	The genes expressed in liver tissues need to be cloned in a vector. Suggest the strategy and the enzymes used in the process.		CO1	PO1	10
		b)	Differentiate between various types of methylases. Discuss their role in cloning.		CO1	PO1	10
	UNIT - II						
	3	a)	Differentiate between cloning, and expression vectors. Provide an example of modern cloning vector with a neat figure and explain various parts of it.		CO2	PO5	10
		b)	Identify the factors that influence gene expression at the level of transcription and translation efficiency.		CO2	PO5	10
	OR						
	4	a)	Provide examples for Plasmids, Phagemids, Cosmids, shuttle vectors and YACs. Define each and add one line of their utility.		CO2	PO5	10
		b)	Design a strategy for cloning a piece of DNA with neat illustrations.		CO2	PO5	10
			UNIT - III				
	5	a)	Enumerate the various steps involved in the isolation of genomic DNA.		CO3	PO5	10
		b)	Differentiate between Northern and Southern blotting. Write steps involved in southern blotting.		CO3	PO5	10
			OR				

	6	a)	Design a strategy for producing millions of copies of DNA of interest. Identify the techniques, its principle with neat diagrams	CO4,3, 5	PO3,6, 7,12	10
		b)	How do you construct genomic library? Write various steps involved with neat figures.	CO4,3, 5	PO3,6, 7,12	10
	UNIT - IV					
	7	a)	Develop a procedure for introducing a plasmid in to a bacterium by calcium phosphate.	CO4,3, 4	PO3,7, 6,12	10
		b)	Design a procedure for introducing a plasmid in to plant cells. Identify and draw a suitable vector and steps involved.	CO,3,4	PO3,7, 6,12	10
	OR					
	8	a)	Micron size inert particles are used to deliver gene of interest cloned in the vector. Discuss the technology, its limitation and advantages.	CO,3,4	PO3,7, 6,12	10
		b)	Discuss the transformation process that involves organelle. Design the vector that is used as vehicle to carry gene of interest.	CO,3,4	PO3,7, 6,12	10
	UNIT - V					
	9	a)	“Virtually any gene can be modified, deleted or added by this modern technology”. Identify this technology and write its principle and mechanism with neat illustrations.	CO6	PO4	10
		b)	Write any 5 genetic engineering applications briefly.	CO6	PO4	10
	OR					
	10	a)	Examine the use of antisense RNA technology involved in the engineering of plants for extended shelf-life of fruits.	CO6	PO4	10
		b)	“Gene therapy is boon to mankind”. Apprise the role of suicide gene therapy in the treatment of cancer.	CO6	PO4	10
