

CBCS SCHEME

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BBT613C

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2026 Synthetic Biology and Tissue Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define Synthetic Biology. List and explain the core concepts that differentiate it from genetic engineering.	10	L2	CO1
	b.	Describe the abstraction hierarchy in synthetic biology with a suitable illustration.	10	L2	CO1
OR					
Q.2	a.	Explain how standard biological parts are used in the design of synthetic systems.	10	L3	CO1
	b.	Analyze the role of computational design tool in synthetic biology.	10	L4	CO1
Module – 2					
Q.3	a.	List the major applications of synthetic biology in therapeutics and diagnostics.	10	L1	CO1
	b.	Diagrammatically represent the models for cell differentiation.	10	L2	CO1
OR					
Q.4	a.	Illustrate the use of synthetic biology in agriculture with atleast two engineered traits.	10	L3	CO2
	b.	Evaluate the impact of synthetic biology in developing low cost vaccines.	10	L4	CO2
Module – 3					
Q.5	a.	What are toggle switches and oscillators? Explain their applications.	10	L1	CO2
	b.	What are Biobricks? Explain their working.	10	L2	CO2

OR					
Q.6	a.	Explain with an example synthetic circuit which mimicry in phages.	10	L3	CO3
	b.	Compare and contrast natural and synthetic polymers used in tissue engineering.	10	L4	CO3
Module – 4					
Q.7	a.	What are the different Scaffold fabrication methods used in tissue engineering?	10	L1	CO3
	b.	Explain how cell proliferation and differentiation are regulated in tissue engineered construct.	10	L2	CO3
OR					
Q.8	a.	Discuss the role of biocompatibility and biodegradability in selecting tissue Scaffold materials.	10	L3	CO4
	b.	Analyze the advantages and limitations of in vitro tissue engineering models compared to in vivo models.	10	L4	CO4
Module – 5					
Q.9	a.	Explain the sequence of events involved in wound healing.	10	L1	CO4
	b.	Explain the mechanical and biological properties of biomaterials.	10	L2	CO4
OR					
Q.10	a.	Illustrate the use of tissue engineered skin and cartilage in clinical applications.	10	L3	CO5
	b.	Critically analyze the ethical regulatory and translational challenges in clinical tissue engineering.	10	L4	CO5
