



First Semester B.E./B.Tech. Degree Examination, June/July 2026 Smart Materials and Systems

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.	Explain nano-materials and their application in construction.	10	L2	CO1
	b.	Explain honey comb structure in carbon composites with sketches.	10	L2	CO1
OR					
Q.2	a.	Discuss engineered polymers with examples, properties and applications.	10	L2	CO1
	b.	Explain emerging sustainable byproducts.	10	L2	CO1
Module – 2					
Q.3	a.	Define Prefabrication with examples and explain its advantages.	10	L2	CO2
	b.	Explain modular coordination with neat sketch.	10	L2	CO2
OR					
Q.4	a.	Explain the types of prefabricated components.	10	L2	CO2
	b.	Explain transportation and installation of prefabricated structures.	10	L2	CO2
Module – 3					
Q.5	a.	Define Smart Materials. Explain piezoelectric effect.	10	L2	CO3
	b.	Explain the types of Sensors used in smart systems.	10	L2	CO3
OR					
Q.6	a.	Discuss the classification of smart materials in detail.	10	L2	CO3
	b.	With neat sketch explain the working of (i) Strain Gauge (ii) Accelerometer	10	L2	CO3
Module – 4					
Q.7	a.	Define BIM and explain its advantages.	10	L2	CO4
	b.	Define IBMS and its types.	10	L2	CO4
OR					
Q.8	a.	Explain BIM in building design with a neat sketch.	10	L2	CO4
	b.	Compare BIM and IBMS.	10	L2	CO4
Module – 5					
Q.9	a.	Explain 3D printing process chain with diagram.	10	L2	CO5
	b.	Discuss application of 3D printing.	10	L2	CO5
OR					
Q.10	a.	Discuss classification of 3D printing technologies	10	L2	CO5
	b.	Explain steps in 3D modeling and data preparation.	10	L2	CO5