

CBCS SCHEME



BME306B

USN

Third Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024
Smart Materials and System

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.	What is the structure of a smart material? Why are smart materials used?	10	L1	CO1
	b.	What are the functions of smart systems, and application area of smart systems?	10	L1	CO1
OR					
Q.2	a.	What are the components of a smart structures briefly explain?	10	L1	CO2
	b.	What are stimulus responsive smart materials? What are examples of stimuli-responsive materials?	10	L2	CO2
Module – 2					
Q.3	a.	What are electroactive elements? Mention the different types of electroactive polymers.	10	L3	CO3
	b.	What do you mean by piezoelectricity? What causes piezoelectricity?	10	L3	CO3
OR					
Q.4	a.	What is the principle of piezoelectricity and give an example?	10	L3	CO3
	b.	What are the properties of piezoceramics and give an example?	10	L3	CO3
Module – 3					
Q.5	a.	What does it mean to be thermally active? And causes of thermal activity.	10	L3	CO3
	b.	What is shape memory alloys? Write the properties and applications shape memory alloys.	10	L3	CO3
OR					
Q.6	a.	Explain the static shape memory effect and its behavior.	10	L4	CO3
	b.	What is the phase transformation of NiTi and transformation temperature?	10	L4	CO3
Module – 4					
Q.7	a.	Define the thermoresponsive polymers. Write the advantages.	10	L4	CO4
	b.	Briefly explain an electroactive polymer and user of electroactive polymers.	10	L4	CO4

OR

Q.8	a.	Explain protein based smart polymers with examples.	10	L3	CO4
	b.	Describe the PH-responsive and photoresponsive polymers.	10	L4	CO4

Module – 5

Q.9	a.	Define the chemical activation. What activates a chemical reaction?	10	L4	CO5
	b.	Define chemical gel, write the difference between physical gel and chemical gel.	10	L4	CO5

OR

Q.10	a.	Explain optical polymers and properties of optical polymers.	10	L5	CO5
	b.	Briefly explain the smart materials for aerospace application, write which material suitable for space.	10	L5	CO5
