Model Question Paper - CBCS Scheme

USN | | | | | | | | | |

15ME745

Seventh Semester B.E. Degree Examination, Dec-2018/Jan- 2019

Smart Materials & MEMS

Time: 3 hrs Max marks: 80

Note:Answer any FIVE full questions, choosing one full question from each module

Module-1

1	a.	What are smart materials? Explain its applications in various fields.	**8 Marks**
	b.	Explain Piezo electric effect. Describe the working of Inch worm linear motor with neat sketch.	**8 Marks**
		OR	
2	a.	Explain with neat sketches the one-way & two-way shape memory effect.	**8 Marks**
	b.	Discuss the vibration control through shape memory alloys.	

Module-2

3	a.	List the Properties & characteristics of MR/ER fluids.	**8 Marks**
	b.	Discuss the applications of MR/ER fluids in Dampers.	**8 Marks**
		OR	
4	a.	Explain the principle of total internal reflection in optical fibers.	**8 Marks**
	b.	Explain the working principle of fiber optics in crack detection.	**8 Marks**

Module-3

5	a	Analyse parallel damped vibration absorber.	**16 Marks**
		OR	
6	a	Explain briefly the intrinsic characteristics of natural structures.	**8 Marks**
	b	Discuss the structural design of wood as fiber- reinforced matrix.	**8 Marks**

Module-4

7	a	Explain with neat sketches, the process of Photolithography.	**8 Marks**
	b	Explain with neat sketch, dry etching of thin films.	**8 Marks**
		OR	
8	a	Explain working of Cantilever Piezoelectric Accelerometer.	**8 Marks**
	b	List major methods of sensing & actuation.	**8 Marks**

Module-5

9	a	List any three materials for polymer MEMS.	**6 Marks**
	b	Discuss the design & fabrication of channels & valves.	**10Marks**
		OR	
10	a	Discuss the design considerations of MEMS sensors in blood pressure monitoring of patients.	**8 Marks**
	b	Discuss the design of gyro MEMS in automobiles.	**8 Marks**