



CBGS SCHEME

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16/17MST422

Fourth Semester M.Tech. Degree Examination, June/July 2019 Smart Materials and Structures

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain reactive actuator based smart structure. (08 Marks)
b. Explain creep and strain rate effects. (08 Marks)

OR

- 2 a. List the properties of piezoelectric materials and applications of piezoelectric materials. (08 Marks)
b. Explain Harmonic excitation. (08 Marks)

Module-2

- 3 a. List and explain applications of Shape Memory Alloys (SMA). (08 Marks)
b. Explain Electro rheological fluid theory (08 Marks)

OR

- 4 a. Explain the working of Shape Memory Alloys (SMA) with microscopic diagram. (08 Marks)
b. Explain vibration control using various characteristics of SMA. (08 Marks)

Module-3

- 5 a. Explain active vibration absorbers with neat sketch. (08 Marks)
b. Explain how fiber optics used to detect crack in any structures. (08 Marks)

OR

- 6 a. Explain vibration characteristics of mistuned systems. (08 Marks)
b. Explain total internal reflection with neat sketch. (08 Marks)

Module-4

- 7 a. Explain miniaturization. (08 Marks)
b. Explain scaling law of Area-Volume ratio. (08 Marks)

OR

- 8 a. Explain intrinsic characteristics of MEMS. (08 Marks)
b. List and explain materials for MEMS. (08 Marks)

Module-5

- 9 a. Explain Resonant pressure sensor with neat labeled diagram. (08 Marks)
b. Explain electrostatic and thermal actuation methods. (08 Marks)

OR

- 10 a. List and explain applications of MEMS. (08 Marks)
b. Explain flexural beam bending of crystal planes. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

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