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10AE764

Seventh Semester B.E. Degree Examination, Dec.2014/Jan.2015
Smart Materials

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What are the characteristics of composite and ceramic materials? (10 Marks)
b. List the processing methods of shape memory alloys and explain any one method in detail. (10 Marks)
- 2 a. With a simple sketches, write the principles of electromagnetic, acoustic, chemical and mechanical sensing. (10 Marks)
b. Discuss the compatibility of conventional and advanced materials to be used as sensors. (10 Marks)
- 3 a. List the characteristics and applications of any two types of MR fluids. (10 Marks)
b. What are the steps involved in designing shape memory alloys? Explain. (10 Marks)
- 4 a. Explain the components of active and adaptive optical systems. (10 Marks)
b. Explain the design and manufacturing principles of optics and electromagnetic. (10 Marks)

PART – B

- 5 a. Explain the applications of structures in aerospace and transportation vehicles. (10 Marks)
b. Discuss in brief manufacturing, repair and maintainability aspects of structures. (10 Marks)
- 6 a. With suitable examples, explain distributed analog and digital feedback control systems. (10 Marks)
b. What are the dimensional implications of structural control? (10 Marks)
- 7 Explain : (20 Marks)
 - i) PCT actuators
 - ii) MEMS.
 - iii) magnetic shape memory alloys
 - iv) applications of the above.
- 8 a. How do you process the information with the help of neural network and data processing? (10 Marks)
b. Explain the principle and application domain of data visualization and reliability. (10 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.