Reg. No. : | | | | | | | | | | |

Question Paper Code: 58761

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

One credit Course

Mechanical Engineering

15UME861 – SMART MATERIALS

(Regulation 2015)

Duration: One hour Maximum: 30 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Fiber glass is the ---------reinforced by glass fibers.

   (a) plastic matrix (b) polymeric matrix

   (c) metal matrix (d) fiber matrix

2. which respond with a change is shape on the application of mechanical stress

   (a) wooden materials (b) plastic materials (c) iron materials (d) smart materials

3. _____type charge sensor for highly sensitive detection of a DNA sequence.

   (a) JFET (b) PTFE (c) LED (d) FET

4. Smart materials find a wide range of applications due to their varied response to

   (a) internal stimuli (b) variation (c) functions (d) external stimuli

5. Self-healing may also be achieved through deliberately applied _____ mechanisms

   (a) psychological (b) chemical (c) mechanical (d) obvious

6. These polymers consist of coil-like polymer chains:

   (a) Thermoplasts (b) Thermosets (c) Elastomers (d) All polymers

7. PTFE means_____

   (a) polytetra-fluid emulsion (b) polytetrafluoroethylene

   (c) polytetra fluorescence (d) polytetra fluid ethanol

8. A smart material may be considered as a replacement for a ----- material

(a) traditional (b) conventional (c) un conventional (d) recycle

9. In addition, due to ------- of smart materials, it may make it useful as a drug-delivery system

(a) adaptiveness (b) biodegradability (c) sensibility (d) bio-medical

10. Magnetostrictive materials exhibit change in ----- under the influence of magnetic field

(a) size (b) length (c) temperature (d) shape

PART – C (1x 20 = 20 Marks)

11. (a) (i) Explain the definition, Concept and Classification of Smart Materilas? (10)

(ii) Explain the various Application of Smart Materials in Sensors(gas, vapors, temperature, strain, stress, adaptive structures) (10)

Or

(b) (i) Explain the Optical Properties(Optical Band gap Engineering, Nonlinear Optical effects, Electrochromic, Photochromic and Thermochromic Effects) of Smart Materials. (10)

(ii) Explain the various Application of Smart Materials (10)