

A

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 98762

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2025

One credit

Mechanical Engineering

19UME862 – SMART MATERIALS

(Regulation 2019)

Duration: 1.30 hours

Maximum: 30 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Fiber glass is the -----reinforced by glass fibers CO1 U
(a) plastic matrix (b) polymeric matrix (c) metal matrix (d) fiber matrix
2. Concrete has Orientation of particle is ----- in all directions CO1 U
(a) uniformly distributed (b) linear distributed
(c) nonlinear distributed (d) randomly distributed
3. Metallic glasses have the properties of more CO2 U
(a) weldability (b) ductility (c) strength (d) durability
4. One of characteristic properties of polymer material _____ . CO2 U
(a) High temperature stability (b) High mechanical strength
(c) High elongation (d) Low hardness
5. A smart material may be considered as a replacement for a ----- material CO3 U
(a) traditional (b) conventional (c) un conventional (d) recycle
6. PTFE means CO3 U
(a) polytetra-fluid emulsion (b) polytetrafluoroethylene
(c) polytetrafluorescence (d) polytetra fluid ethanol

7. HUMS means CO4U
- (a) health and usage monitoring systems
 (b) heat and universal monitoring system
 (c) health and universal monitoring system
 (d) heat and U-V ray monitoring system
8. ----- type charge sensor for highly sensitive detection of a DNA CO4 U
 sequence
- (a) neurotransmitters (b) neuroelectrons (c) neuro particles (d) neuro sensors
9. The smart materials is one that responds to a stimulus in its ----- in a CO5 U
 useful way.
- (a) industry (b) spaces (c) environment (d) earth
10. ----- displays is applicable for wearable electronics and smart fabrics CO5 U
- (a) liquid crystal display (LC(D)) (b) cathode ray tube (CRT)
 (c) light emitting diode(LE(D)) (d) Organic Light Emitting Diode (OLED)

PART – B (2x 20= 40 Marks)

16. (a) Define Composite Materials. Explain the structural composite CO1- U (20)
 materials with suitable sketch
- Or
- (b) List and explain the applications of shape memory alloys CO1- U (20)
17. (a) Explain the Thermo - Mechanical Properties (Shape Memory effect CO2- U (20)
 and Self-Healing effect) of Smart Materials.
- Or
- (b) Explain vibration control using various characteristic of SMA CO3- U (20)