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Question Paper Code: 98762

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2022

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. Piezo-electric materials are used in CO1-U
(a) Transducer (b) Load gauges (c) Batteries (d) Switches
2. _____ which respond with a change in shape on the application of mechanical stress CO1-U
(a) Wooden materials (b) Plastic materials (c) Iron materials (d) Smart materials
3. Piezo-electric materials are used in----- CO1-U
(a) transducer (b) load gauges (c) batteries (d) switches
4. Intelligent materials which sense any environmental change and respond to it in an CO1-U
(a) optical manner (b) electro manner (c) eco-friendly (d) metal composites
5. The Smart Control System will provide---- for the sensors and actuators. CO2-U
(a) quality (b) condition (c) feedback control (d) signals
6. The $(BN)_{1-x}(C_2)_x$ alloys are promising materials for band-gap engineering in CO2-U
(a) 1Delectronics (b) 2Delectronics (c) 3Delectronics (d) all the above
7. One of the characteristic properties of polymer material _____. CO2-U
(a) High temperature stability (b) High mechanical strength
(c) High elongation (d) Low hardness

8. -----type charge sensor for highly sensitive detection of a DNA sequence CO2-U
- (a) JFET (b) PTFE (c) LED (d) FET
9. Smartness describes self-adaptability, ----- memory and multiple functionalities of the materials or structures. CO3-U
- (a) Self – assembly (b) Self-sensing (c) Capability (d) Consciously
10. The end products of organic pigments CO3-U
- (a) UV liquid (b) fluorescence (c) poly acryl (d)minerals

PART – B (1x 20 = 20 Marks)

11. (a) Apply the concept and discuss about Electrical properties (piezoelectric effect) of smart materials with suitable example. CO2-App (20)
- Or
- (b) Select and explain the application of smart materials in self-healing protective surfaces of aircraft CO3-App (20)