Reg. No. :

Question Paper Code: 99B01

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

Elective

Biomedical Engineering

19UBM901- Bio-MEMS and Nano Electronics

(Regulations 2019)

Duration: Three hours   Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. Give three examples of the objects that you are personally recognize to be of the size of approximately 1mm.   CO1- U

2. Why silicon is an ideal material for MEMS?   CO1- U

3. Define Pull in effect.   CO2- U

4. What is the application of inchworm motor?   CO2- U

5. What are Shape memory alloys?   CO3- U

6. What is difference between scanning and tunneling microscope?   CO3- U

7. What are magnetic sensors?   CO4- U

8. Why cellular bio scanning is important in Nano sensor.   CO4- U

9. How are nanotubes used for cancer?   CO5- U

10. How are Nano materials used in cancer treatment?   CO5- U

PART – B (5 x 16= 80Marks)

11. (a) Write short notes on Polymers and Packaging materials in MEMS.   CO1- U   (16)

Or

(b) Write a detailed note on photolithography and explain different types of lithography with suitable figures?   CO1- U   (16)

12. (a) Explain the Application of FEM in stress analysis of silicon die in a pressure sensor.   CO2- U   (16)

<div align="center">Or</div>

(b) Discuss about creep deformation in thermo mechanics in detail.   CO4- E   (16)

13. (a) Discuss in detail about the evolution of Bedside Practice.   CO3-U   (16)

<div align="center">Or</div>

(b) Explain about the bottom-Up Pathways to Molecular Manufacturing.   CO3-U   (16)

14. (a) Explain construction and working principle of LVDT. Explain how it will detect displacement.   CO4- App   (16)

<div align="center">Or</div>

(b) Describe how vivo medical is applicable in health care monitoring.   CO4- App   (16)

15. (a) Examine how the nanotechnology is used in drug delivery?   CO5- U   (16)

<div align="center">Or</div>

(b) Discuss about an application of nanotechnology in the early diagnosis and comprehensive treatment of cancer.   CO5- U   (16)

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