

B.Tech. SEM -VI Bio Medical 2014 Course (CBCS) : WINTER - 2018

SUBJECT: BIO MEMS

Day: Wednesday
Date: 14/11/2018

W-2018-2508

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

Q.1 Define MEMS and microsystem. Also differentiate between microsystem and microelectronics. [10]

OR

Q.1 a) Explain following electrical concepts: [05]
i) Conductor ii) insulator iii) semiconductor

b) With the help of block diagram explain in detail MEMS as a sensor and MEMS as a actuator. [05]

Q.2 Explain in detail with neat schematic silicon as a substrate material. Also give the importance of silicon material in MEMS. [10]

OR

Q.2 Define micro total analysis system (μ TAS) and with the help of neat diagram describe fluid control components and sample handling in μ TAS. [10]

Q.3 Explain in detail following: [10]
i) 'Electrostatic sensing and actuation'
ii) 'Magnetic sensing and actuation' with neat schematic

OR

Q.3 a) Write a note on : i) neural interfaces ii) microsurgical tools. [05]

b) Describe in detail micro needles and drug delivery system. [05]

Q.4 With the help of neat schematic explain procedure of surface micromachining. [10]

OR

Q.4 With the help of neat diagram explain lithography technique. [10]

Q.5 With the help of neat schematic explain in detail MEMS metrology. [10]

OR

Q.5 Define MEMS. Also explain in detail various techniques for MEMS packaging. [10]

Q.6 With the help of neat diagram explain MEMS based capacitive accelerometer. [10]

OR

Q.6 Explain in detail following MEMS based softwares: [10]
i) MATLAB ii) Auto CAD iii) Spice

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