1T00318 - B.E.(BIOMEDICAL)(Sem VIII) (CBSGS) / 52302 - Biomedical Microsystems

Q.P. Code : 36000

(3 Hours)

Total Marks: 80

N.B.: (1) Question **no. 1 is compulsory.**
(2) Answer **any3** out of remaining **5** questions.
(3) Figures on the right indicate full marks.
(4) Assume data wherever necessary.

1. (a) Discuss flow techniques in microfluidics. 5
   (b) Discuss silicon wafer cleaning process. 5
   (c) Explain various projection systems used in photolithography. 5
   (d) Explain various drug delivery vehicles. 5

2. (a) With the help of suitable diagrams, explain fabrication process of any one MEMS product using bulk micromachining and explain any one etch stop technique. 10
   (b) What are cantilevers? Explain its use as a biosensor mentioning detection techniques. Discuss its fabrication with diagram at each step. 10

3. (a) Discuss need of surface characterization. Discuss AFM in detail with block diagram and applications. 10
   (b) Define soft lithography and explain micro contact printing in detail mentioning SAMs. 10

4. (a) What is doping? Explain its type in details with advantages and shortcomings. 10
   (b) With the help of suitable diagram explain µTAS. Also explain fabrication of any one type of micropump with neat diagram at each step. 10

5. (a) Define PVD and discuss its two types in detail with neat block diagram, merits and demerits. 10
   (b) Compare MEMS packaging with IC packaging. Discuss packaging of pressure sensor in detail. 10

6. Write short notes on (Any four) 20
   (a) Anisotropic Wet etching
   (b) Steps of photolithography
   (c) Silicon
   (d) Scaling laws in fluid mechanics and electricity
   (e) SOI fabrication techniques