

TE Instrumentation sem V (choice based) 31/05/19

(3 Hours)

Total Marks: 80



- N. B. 1) Question No. 1 is compulsory.
2) Answer any 3 questions from the remaining 5 questions.
3) Assume suitable data wherever necessary.

- Q1 Solve any four 20
(a) Explain MEMS fabrication technique LIGA.
(b) Explain important properties of chemical sensors.
(c) Write note on sensors for food processing like smell or odour, taste.
(d) Give comparative study of thermal sensors.
(e) Explain working principle of digital humidity temperature smart sensor.
- Q2 (a) Explain various techniques of etching for MEMS sensor fabrication 20
(b) Explain photolithography technique used in MEMS.
- Q3 (a) Explain briefly:- 20
(1) Surface processing using sputtering
(2) Chemical vapor deposition
(b) Explain selection criteria for various transducers? Also elaborate design considerations for sensor fabrication.
- Q4 (a) Explain in brief 20
i) ADXL 345
ii) MEMS gyroscope
(b) Give comparative study of analog to digital converters used for sensor signal conditioning.
- Q5 (a) Write about different materials used in sensor fabrication. 20
(b) Explain in detail differences between thin film and thick film sensors.
- Q6 Write short note. (Any Four) 20
a) Surface and bulk micro machining
b) Any one application of optical sensors
c) Biological Oxygen Demand (BOD)
d) Agriculture measurements such as soil moisture, wind speed, leaf wetness duration
e) Measurement of carbon dioxide (CO_x)