

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

15NT73

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021 MEMS and NEMS

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Give the meaning of miniaturization and explain the benefits. (08 Marks)
b. List and explain the steps involved in fabrication of IC's. (08 Marks)

OR

- 2 a. Explain 4 types of MEMS packages. (08 Marks)
b. Write a note on : i) Micro fluidics ii) RF – MEMS. (08 Marks)

Module-2

- 3 a. With sketch, explain the working principle of optical wave guide transducer. (08 Marks)
b. Explain the operation of Electro chemical transducers, with suitable sketch. (08 Marks)

OR

- 4 a. Brief about : i) Quartz crystal imbalance ii) Film bulk Acoustic wave. (08 Marks)
b. With the help of neat sketch, explain the importance of cantilever based transducer. (08 Marks)

Module-3

- 5 a. Differentiate between Surface and bulk micro machining. (08 Marks)
b. List and explain the various etching methods. (08 Marks)

OR

- 6 a. Describe the various thin film techniques and give their applications. (08 Marks)
b. Define Piezoelectric effects and explain the mechanism with example. (08 Marks)

Module-4

- 7 a. Explain the concept of reliability and stability related to MEMS. (08 Marks)
b. Brief about the various failure mechanisms. (08 Marks)

OR

- 8 a. Explain the working of signal amplifiers and signal conditioning. (08 Marks)
b. Explain the basics of control theory with necessary case studies. (08 Marks)

Module-5

- 9 a. Define NEMS. Explain the Nano machining of NEMS. (08 Marks)
b. Explain Electron beam lithography with sketch. (08 Marks)

OR

- 10 a. Write a short on Stencil lithography and Sacrificial etching. (08 Marks)
b. Explain the future challenges and applications of NEMS. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.